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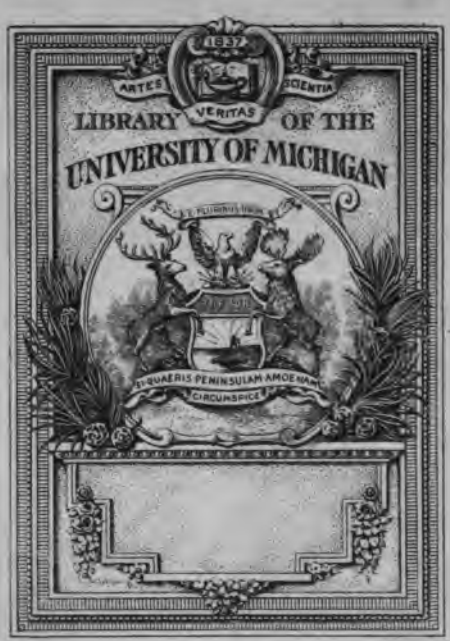
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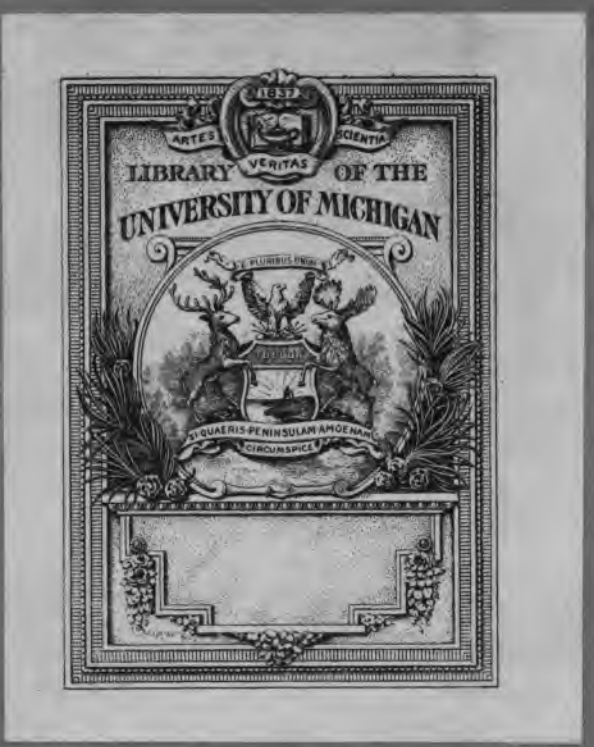
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ON

NECROSIS:

BEING AN EXPERIMENTAL INQUIRY

INTO THE

AGENCY ASCRIBED TO THE ABSORBENTS,

IN THE

REMOVAL OF THE SEQUESTRUM.

WITH SOME OBSERVATIONS

CONCERNING

THE ADHESION OF LIVING TO DEAD BONE.

BY GEORGE GULLIVER, Esq.,

ASSISTANT-SURGEON, ROYAL HORSE GUARDS.

COMMUNICATED BY

SIR JAMES M'GRIGOR, BART., F.R.S.

READ NOVEMBER 8TH, 1836.

Perhaps there is no subject in surgical pathology which has been more diligently investigated than that of necrosis. Independently of its practical importance, the phenomena connected with the death and separation of the old bone, and the admirable resources of nature in the formation of a new one, must ever be regarded with great interest.

It is not therefore surprising that numerous theories have been offered in explanation of this disease; but those who have examined these must have perceived how widely they differ from each other, and that many of the facts adduced are of a no less contradictory nature.

. Hence I have undertaken an experimental inquiry into the subject, and without attempting a theory of necrosis, have endeavoured to determine, in the first place, what becomes of the dead bone, and secondly, the means by which it is replaced. In the prosecution of this object I have principally employed dogs and rabbits, and although I am aware that observations made on the lower animals are not always applicable to the physiology of man, it will probably be allowed that the points at issue are susceptible of illustration by experiment.

In the present paper I propose only to relate some observations and experiments instituted with a view to the examination of the first question, namely, whether dead bone admits of removal by absorption; reserving the consideration of the other means by which it may be discharged for a future occasion.

While engaged in the formation of the catalogue of the museum of the Army Medical Department at Chatham in 1829, I was led, from the examination of numerous specimens of necrosis in that collection, to entertain a suspicion that the doctrine of the absorption of dead bone, so confidently asserted in the schools as an ascertained fact, might notwithstanding be founded in error,—and a further attention to the subject tended to confirm this persuasion. As far as I could judge from my own observations, it did not appear necessary to attribute the form and appearance of the dead bone to the agency of the absorbents after it had ceased to be a part of the living body, the facts appearing susceptible of explanation

otherwise; while many cases presented phenomena altogether at variance with the received opinion. I soon learned that Mr. Liston and Mr. Syme, who possessed unusual opportunities for observation, had formed a similar view of the subject, while another great authority, Mr. Stanley, had arrived at a directly contrary conclusion: and Mr. Key, in a communication, recently printed in the Transactions of this Society, has minutely described the absorption of dead bone, in order to illustrate the process of ulceration in articular cartilage.

I have no opportunity of consulting the numerous original works which have appeared at different times concerning necrosis, but it is unnecessary in this place to exemplify the extent to which the doctrine of the absorption of dead bone has been believed and promulgated, since it is generally taught in the schools of London, and an enumeration of those who have adopted it would comprehend almost every writer of eminence on the subject. Dr. Thomson, indeed, although admitting the power of granulations in absorbing dead bone, considers the subject deserving of further inquiry; and Dr. Craigie simply attributes the removal of the old bone to its separation through the new osseous cylinder.

The facts which are brought forward in proof of the absorption of dead bone are simple enough, and easily enumerated; to wit, the gradual disappearance of the sequestrum in many cases of alleged necrosis; the irregular and eroded state of the dead portion; the contact of granulations with the indentations on its

surface; the absorption of the fang of a transplanted tooth; and finally, it has been stated, I believe either on the authority of Mr. Abernethy or Sir William Blizard, that portions of dead bone had diminished in weight after having been kept in contact with the granulations of an ulcer*.

The explanation deduced from all these circumstances would appear irresistible if we inquired no further, but there are facts which must have been observed by almost every practical surgeon altogether at variance with this theory. It appears indeed somewhat extraordinary that Wiedmann, F. Ribes, and Jules Cloquet, never doubted the agency of the absorbents in the removal of dead bone, although they had each observed examples in which it had been incarcerated for years, without apparent diminution, in a new osseous cylinder, from the internal surface of which more or less purulent matter was secreted. Mr. Liston adduces cases of detached pieces of bone in similar circumstances long remaining unaltered in form, in some of which amputation of the limb was required from the irritation of a dead portion so small, that it is inconceivable how it could have re-

* In Mr. Palmer's edition of the works of John Hunter, the following note appears. "Portions of dead bone were often observed to be entirely absorbed in cases of necrosis; and in some experiments made by Mr. Thomas Blizard, in which disks of bone were bound on over ulcers, the surfaces of these disks were found to be eaten out, or destroyed, just as in common caries." Vol. I. p. 255. The result of my experiments justifies the belief that there must be some mistake in this statement.

sisted absorption, if that were the process employed by nature for the removal of dead bone; and Mr. Syme mentions similar instances.

But if the sequestrum is not absorbed, what becomes of it? It may be remarked, in the first place, that they are not all cases of necrosis that have been so denominated. Under this head, in the museums of anatomy, a class of specimens is sometimes presented to our notice which seem to me to admit of an explanation differing from that commonly assigned to them. These are generally the shafts of the long bones, prodigiously thickened and irregularly perforated with holes for the transmission of blood vessels, or by cloacæ leading to the cavities of abscesses, and sometimes singularly crooked and mis-shapen, as if at one period of the disease they had been softened, and influenced by mechanical force. In the centre of such bones a very small portion is sometimes found dead and detached, but more frequently the shaft is simply very thick and dense throughout. The former have frequently been regarded as examples in which the absorption is nearly effected; the latter as the completion of this process. It is probable that both are instances of long continued inflammation of bone, the first attended with death and separation of a small central fragment, which had afterwards undergone no alteration of form, and that the second was never at any period a case of necrosis.

The deposition of a cylinder of new bone around the old one, is not an absolute proof of the death of the latter, as I have had frequent opportunities of

ascertaining in the course of my experiments. Nature often exhibits a prospective contrivance in the formation of a new osseous shell, or in the enlargement of a part of the old shaft, before actual necrosis has taken place; a fact which has not escaped the observation of Mr. Russell and Dr. Macartney. In the museum of St. Bartholomew's hospital, there is the tibia of a dog incased in a shell of new bone, and partly detached, but the injection has run pretty freely into the old bone *. In such instances, the part which has suffered the most intense inflammation may become partially eroded, and gradually removed by absorption, if it retain its vitality long enough, while a deposition of new osseous matter gradually supplies the loss, death of the old bone having formed no part of the phenomena. This is probably the explanation of many cases of alleged absorption of dead bone. But if a piece of bone truly dead, be inclosed within a new osseous cylinder, then it is indeed a bad case of necrosis, which the patient will carry to the grave with him, unless relieved of the sequestrum otherwise than by absorption.

The worm-eaten appearance on the surface of many sequestra may be explicable in two ways. The most numerous examples of this kind are those of necrosis of the inner layer of the shaft of the long bones, with thickening of the outer portion,—a form

* It is proper to notice that Mr. Stanley considers this to be doubtful. The preparation will be found under the head of "Bone," No. 10.

of disease known to Bordenave, Haller, Collison, and Tenon; and since more fully explained by Brun, Brugnoni, Penchianati, Dr. Knox, Mr. Syme, and others. In such cases, irregular death, and separation of a portion of a bone, may be expected to produce an equally irregular surface: the part would not necessarily die in a determinate form, any more than in cases of sloughing of soft textures; and when the outer layer of an entire cylinder of necrosid bone presents erosions on its surface, it seems more reasonable to refer these to the effect of the ulcerative process, while the part retained its vitality, than to the action of the absorbents after its death.

The aspect and situation of the granulations is equally inconclusive. They are seen to be extremely vascular, and accurately corresponding to the indentations on the under surface of a superficial layer of dead bone in progress of exfoliation, a case in which it has not often been supposed that the dead portion suffers diminution from the absorbents, the action of which is confined to the surface of the living bone in immediate contact with that about to be separated. The vascular structure adjusted to the superficial excavations on the surface of the sequestrum, is what might be expected from the work of exfoliation in some instances, or from the extension of the ossific process into the vacant spaces in others.

I am not aware that the absorption of the fang of a transplanted tooth is a well authenticated fact; but if so, it would seem to indicate that the tooth, having preserved its vitality, had become a part of the living

body to which it was attached, and accordingly subject to its laws.

With regard to the diminution said to have taken place in portions of dead bone kept in contact with the granulations of an ulcer, we require more precise information. It will be seen that the statement is altogether at variance with the result of my experiments. Dr. Davy has suggested to me, that if dead bone be subjected to the combined action of air, heat, and moisture, it might lose weight from the decomposition of its animal part, especially if the discharge were long confined; and the comparative lightness of bones in which the putrefactive fermentation has proceeded favourably, must be familiar to those who have observed the maceration of skeletons.

I proceed to the narration of some cases and experiments by which I have been led to the opinions expressed in this paper. The results of many of the experiments are preserved in the museum of the Army Medical Department, which is open to the profession through the kindness of the Director-General.

CASE I.

A man suffered amputation of the thigh, and the bone was covered in the usual manner by the soft parts. Profuse suppuration ensued, and the patient died four months after the operation, exhausted by hectic fever and diarrhœa.

The entire circumference of the extremity of the thigh bone was found to be dead, and partly sepa-

rated from the living bone, but the surface on which the saw had acted was precisely in the same condition as when first divided. (Loc. D. 4. No. 28, in the Museum of the Army Medical Department.)

CASE II.

A boy, aged 17, was the subject of necrosis involving the whole internal circumference of the shaft of the humerus. A small part of the sequestrum protruded and was removed by the cutting pliers, but the remaining greater portion was so firmly incarcerated that it was not extracted until four months subsequently, during which time it was imbedded in the soft textures. The edges of a cut, which had been made in the sequestrum at the time of the operation, and which may be seen in the upper part of the preparation, had undergone no change whatever. The patient recovered. (C. 6, in Mr. Liston's collection.)

CASE III.

A patient had anchylosis of the metacarpal bone with the proximal phalanx of the great toe. The articular extremities became necrosid, and several small sequestra were discharged, the disease having continued twenty-four years. The metacarpal bone was divided near its base with the cutting pliers, and the diseased bones removed; and the base was subsequently excised to secure the anterior tibial artery. A blackened sequestrum, about the size of a horse-bean, was found in a cavity in the situation of the

articulation of the phalanx with the metacarpal bone, where it had probably been inclosed for a series of years. (F. 1, in Mr. Liston's museum.)

CASE IV.

A female, aged 50, had a collection of pus on the fore part of the thigh, communicating with the knee-joint. The abscess opened, profuse discharge occurred, and the patient was reduced by hectic fever, when the limb was removed, and she completely recovered.

The lower third of the femur was enlarged and irregular on the surface. In its anterior part was a small cloaca with smooth edges, through which might be seen a minute sequestrum of the cancellated structure, which had probably been so situated for upwards of two years. (C. 22, in Mr. Liston's collection.)

CASE V.

Miss M——, aged 20, had necrosis of the proximal phalanx of the great toe. The dead portion was ascertained to be loose, and an attempt was made to remove it by the assistance of a small screw. Twelve months afterwards, there being reason to suppose that the joint was implicated, the member was amputated. The sequestrum, about the size of a horse-bean, was found to involve a part of the articular surface; and it was loosely confined in a cavity, but in such a manner that extraction could not have been easily effected. (C. 65, in Mr. Liston's collection.)

EXPERIMENT I.

A thin portion of the surface of the shaft of a human tibia was kept in contact for seventeen days with a large ulcer studded with granulations, in a man's leg. The bone having been removed, dried, and weighed, was found to have undergone no alteration either in weight or appearance.

EXPERIMENT II.

A section of the internal circumference of the shaft of the human tibia, weighing 8.9 grains, was introduced into a seton at the back of a man's neck, and allowed to remain there thirty-two days, during which time the suppuration was very scanty. On examination of the bone, it was found to have undergone no change whatever, either in weight or appearance.

EXPERIMENT III.

A thin portion of the external part of the human fibula, from near the upper extremity of the bone, weighing 6.7 grains, was put into a seton at the back of a man's neck, and kept there twenty-nine days. The suppuration was very scanty. The bone presented no alteration either in weight or appearance.

EXPERIMENT IV.

A section of the shaft of the human humerus, weighing 10.7 grains, and comprehending the en-

tire thickness of the bone, was introduced into a seton at the back of a man's neck, and retained there sixty-five days. The suppuration was at first scanty, but became copious during the latter five weeks. The bone was removed, and found to have undergone no alteration in appearance, but it had increased exactly one tenth of a grain in weight, probably from some albuminous matter which was not entirely dissipated by drying.

EXPERIMENT V.

A portion of a man's fibula was kept deeply imbedded for five weeks in the soft parts of a dog's leg. There was rather copious suppuration. On examination after the part had been injected, the bone was found unchanged, and the cavity in which it was contained was shewn to be very vascular. (C. 66, in Mr. Liston's collection.)

EXPERIMENT VI.

A portion of the shaft of a dog's thigh bone, weighing 7.8 grains, was introduced deeply between the muscles and periosteum of another dog's leg, and kept there two months. Suppuration was soon established, and continued till the animal was killed. The bone had suffered no alteration whatever. The cavity in which it had lain was very vascular, being made deeply red by injection with size and vermilion.

EXPERIMENT VII.

A portion of the shaft of the human tibia, weigh-

ing 9.8 grains, was introduced into the subcutaneous cellular substance of a dog's leg, and allowed to remain there three months. The wound soon healed, and continued well for nearly two months, when a small ulcerated aperture formed in the cicatrix, in consequence of the bone having been moved about roughly, and suppuration ensued. The bone was found to have undergone no alteration whatever.

EXPERIMENT VIII.

A thin portion of the shaft of the human humerus was placed in the subcutaneous cellular tissue of a dog's leg, and allowed to remain there four months. The wound soon healed, and continued sound till the animal was killed. The bone had suffered no change whatever: it adhered slightly to the cellular substance, so as to stretch out the filaments of the latter as the bone was pulled away.

EXPERIMENT IX.

A piece of the metacarpal bone of a rabbit was introduced into the medullary canal of the tibia of another rabbit, where it remained seven weeks. The wound readily healed, and the animal continued healthy and active until it was killed.

The foreign bone, which I had not weighed previously to the experiment, had undergone no appreciable change: it was imbedded in a soft substance, which I have shewn to be highly vascular by injection. The tibia was simply thickened. (E. P. B.

34 and 54, in the museum of the Army Medical Department.)

EXPERIMENT X.

The fibula of a rabbit was introduced into the medullary canal of the tibia of another rabbit, where it was kept thirty-six days. I omitted to weigh the fibula. It had undergone no appreciable diminution, but a portion of new bone was adherent to its surface. The tibia was enlarged by osseous deposit, both on its outer and inner surfaces, and the foreign bone had become firmly locked in the centre of the new bone. (E. P. B. 50, in the museum of the Army Medical Department.)

EXPERIMENT XI.

A portion of the shaft of a rabbit's tibia, weighing 2.1 grains, was put into the medullary canal of the tibia of another rabbit, and retained there thirty-four days.

The foreign bone was found to have undergone no change: it was surrounded by highly vascular lymph, and there was a large cyst, which had not yet burst, containing a white, concrete, purulent matter, and communicating with the cavity of the tibia. (E. P. B. 35 and 36, in the museum of the Army Medical Department.)

EXPERIMENT XII.

A piece of the shaft of a rabbit's tibia, weighing 1.5 grain, and a bit of the spongy extremity of the

same bone, weighing one grain, were kept in the medullary cavity of another rabbit's tibia for twenty-five days. The weights were marked on these portions of bone with a black lead pencil.

On being removed and dried, the first portion was found unchanged, and the second had increased one tenth of a grain in weight, probably from matter which had not been dissipated in drying. The pencil marks were not obliterated.

There was much inflammation of the limb, and pus with vascular lymph surrounded the adventitious portions of bone. (E. P. B. 48 and 49, in the museum of the Army Medical Department.)

EXPERIMENT XIII.

A section of the shaft of the human tibia, weighing 3.8 grains, was introduced into the medullary canal of a rabbit's tibia, and kept there till the animal was killed, twenty-five days after the operation. The limb was removed and macerated three months, when the bit of bone was ascertained to have undergone no alteration. There was no suppuration. (E. P. B. 55, in the museum of the Army Medical Department.)

EXPERIMENT XIV.

A portion of the shaft of a rabbit's tibia, weighing 1.5 grain, was introduced into the medullary canal of the left tibia of another rabbit, and twenty days subsequently a similar piece, weighing 1.7 grain, was put into the tube of the right tibia. The

animal was killed seven weeks after the first operation, and the limbs were macerated four months.

The adventitious pieces of bone had undergone no change, and the tibia presented no disease. The animal had grown considerably, and had been throughout active and healthy, excepting three or four days after each experiment. (E. P. B. 59, in the museum of the Army Medical Department.)

EXPERIMENT XV.

A bit of the shaft of a rabbit's tibia, weighing 2.2 grains was introduced into the tube of another rabbit's tibia, and kept there seven weeks. The wound healed in the course of a few days.

The adventitious bone weighed 2.37 grains, and it was firmly imbedded in the medullary canal. The increase of weight was accounted for by two well defined specks of new osseous matter deposited on its surface; and these deposits were removed and analysed by Dr. Davy, who found their composition to be that of true bone. (E. P. B. 57 and 58, in the museum of the Army Medical Department.)

EXPERIMENT XVI.

A portion of the shaft of the human tibia was weighed, and introduced into the tube of a rabbit's tibia, seven weeks after which the animal was killed.

The limb was macerated three months during the summer, when a part of the circumference of the tibia being removed to expose the foreign bone, it was

found firmly adherent to the inner surface of the rabbit's tibia, and the union was effected by true osseous substance, as proved by the analysis of Dr. Davy. (E. P. B. 56, in the museum of the Army Medical Department.)

EXPERIMENT XVII.

A portion of the human tibia was introduced into the tibia of a rabbit about half grown. The animal continued active and healthy, and grew to the adult size. It was killed fourteen weeks after the operation, when the foreign bone was found to be firmly agglutinated to the rabbit's tibia, by new osseous matter. (C. 57, in Mr. Liston's collection.)

EXPERIMENT XVIII.

A portion of a rabbit's tibia, weighing 1.1 grain, having been made to exfoliate by cauterization, was introduced into the medullary canal of the other tibia of the same animal.

After remaining there forty-two days, it was found to have undergone no alteration.

EXPERIMENT XIX.

A splint of a man's bone was introduced into the medullary canal of a rabbit's tibia. The animal became healthy and playful after the operation, and was kept as a pet in the house, for upwards of fifteen months, until it died. The inclosed bone was found to have suffered no change; it was separated from

the tibia, which was somewhat thickened, by boiling. (C. 58, in Mr. Liston's collection.)

These experiments are selected from a great number which I have made, all tending to the same conclusion. They have not been sufficiently varied and extensive to admit of being adduced as peremptory proof of the impossibility of the absorption of dead bone, in opposition to the incontestable power of the absorbents in the removal of inorganic particles from the living body; but I conceive that it is now fully established, with how much difficulty dead bone is subject to absorption, and that whatever may be the agency of this process in the removal of living parts, it can no longer be regarded as the means by which the sequestrum disappears in cases of necrosis.

The result of the inquiry is not altogether devoid of interest in relation to some important physiological questions. The occasional persistence of bullets in the living body has been usually ascribed to the slight irritation produced by them in the contiguous tissues. But the consolidation by osseous substance, of dead with living bone, is a curious fact in the history of adhesion, which may tend to illustrate the nature of the union between the vascular and extra vascular parts of animals, and to shew that the opinion of Mr. Hunter concerning the vitality of transplanted parts is not without exception.

It appears to me to be a very interesting fact, that a tissue which has been long dead should possess the

power of attracting, as it were, particles similar to itself from the blood. To complete the resemblance to assimilation, we have only to suppose the dead matter to be porous, and the new particles attracted to its interstices. And if new bone can be deposited by the neighbouring living textures on a dead substance, and become firmly adherent to it, as shewn in the experiments 10, 15, 16, and 17, we may be permitted to doubt the conclusions of those physiologists who adopt the views of Haller and Dethlef concerning the reparation of injured bones, since the close connection of the new to the surface of the old bone, is no proof that the former was secreted by the vessels of the latter, however necessary in human subjects the presence of the old bone may be to the establishment and continuance of the ossific process.

But as I propose to institute further experiments concerning this subject, it may be proper to defer its consideration for a future occasion.

NOTE

ON THE

COMPARATIVE PREVALENCE

OF

CALCULOUS DISEASES,

ETC.

BY A. COPLAND HUTCHISON, F.R.S. L.&E.

COMMUNICATED BY

SIR ASTLEY COOPER, BART.

READ DECEMBER 13TH, 1836.

In the 9th and 16th volumes of the Medico-Chirurgical Transactions of London, are two Papers by me, entitled "On the Comparative *Infrequency* of Calculous Diseases among Sea-faring People," and in the latter of these Papers there is appended, also, some account of the comparative *frequency* of this malady in Scotland, in opposition to the generally received opinion, that the disease very seldom occurred in that country; but into this part of the question it is not now my purpose to enter, farther than to state that during an excursion through several counties of Scotland, only a few months ago, I find, from the concurring testimony of several intelligent and experienced surgeons, that I had considerably underrated the frequency of this disease in that country, although I had given to it three times the number of cases of any previous writer.

It has been stated, in opposition to my opinions,

that although calculous diseases have been proved to be exceedingly rare among sea-faring people,—to amount, indeed, almost to a total exemption,—that such exemption arises more from the circumstance of this class of people having embraced their insular employment after the calculous diathesis is supposed to have been passed by—namely, the period of youth, than from any immunity they may possess from their particular situation and mode of life, according to my previous statements.

Those who have advanced this doctrine should, however, recollect that I have elsewhere distinctly observed, that boys, at the early ages of nine and ten years, were admitted into ships of war as midshipmen, officers' servants, or in the merchants' service as cabin boys; and it can be shewn, from data not to be disputed, that more than twice the number of operations for stone are performed on persons after the age of fourteen even, than before that period of life*.

Aretæus, who (according to Dr. Priestley) flourished 300 years before the Christian æra, says, speaking of the cure of calculous diseases,—"but diet and anointing, and sailing and passing one's life at sea—all these are remedial in diseases of the kidneys†."

* See Table in Medico-Chirurgical Transactions, Vol. XVI. page 118, for the ages of persons operated upon for stone.

† —"δίατα δὲ καὶ ἄλειψις καὶ πλοῦς καὶ ἡ ἐν θαλάσσῃ βιοτὴ, ἅπαντα τοῖσι ἐπὶ νεφρῶν ἐστιν ἄκεα."—Χρονίων Παθων Θεράπ. Βιβ. Β. κεφ. γ. Θεραπεία λιθιάσεως καὶ ἰλκώσεως νεφρῶν.

I was in truth not aware of this passage in Aretæus when my papers were published, else I should have been most happy to have given this ancient author the "suum cuique;" and indeed it was not until a short time ago, when my learned friend Dr. Henry Lee, of Charlotte Street, Bloomsbury, pointed it out to me. In embracing this opportunity of mentioning it, I cannot but remark upon the extraordinary coincidence of opinion with so accurate and classical a writer,—the only difference between us being, that he recommends a sea-faring life, or voyaging, as a *cure* for stone and disease of the kidney, whereas my statements have only gone to prove that these diseases do not commence or originate in a sea-faring person;—that, in short, the disease is not known to exist among this class of men, and hence, therefore, it is presumed, that a sea-faring life or voyaging is both a cure and preventive of one of the most painful and distressing maladies by which human life is assailed.

I shall make no comment on the subject of this note, but leave it to the Society to form its own opinion upon the importance of these communications altogether; and to the future labourer, in the same field, to appreciate their value.

I have applied to Sir William Burnett, the Physician-General to the Navy, for an account of such cases of stone and gravel as may have been admitted into the naval hospitals at home and abroad, from April 1830, the period of my last communication on this subject to the Society, up to the present date,

and the answer returned is as follows.—"I have caused the returns of the naval hospitals at home and abroad to be carefully examined from April 1830 to the present time, with reference to the prevalence of calculous disorders, and the only instance of the kind is one case of renal calculi, in Malta hospital, in Michaelmas quarter, 1833; the patient was purser of the Pelican sloop of war." P.S. "He was discharged, cured, in the same quarter."

"Signed, WILLIAM BURNETT.

"26th Nov. 1836."

The average number of seamen and marines annually voted by parliament from 1830 to the present date, *including* 2000 *boys*, has been 30,000. The latter are particularly specified, in the navy estimates, as boys.

I have hitherto scrupulously forborne to offer any opinion on the treatment of calculous diseases, as the result of my extended statistical enquiry into the subject, but it may not be out of place for me here to state, that pure air—a lax state of the bowels—iodine used internally in proper doses, and externally over the region of the kidneys—the use of swings, either in a garden or elsewhere—active bodily exercises—warm clothing, such as flannel dresses worn next the skin, and a very sparing use of vegetables, —seem to me to be the remedial and preventive measures indicated in such cases from a careful review of the statements contained in this and my former papers. One or more, or all of these, according to

circumstances, may be advantageous, where sea-voyaging and a sea-life are impracticable.

Wimpole Street,
28th Oct. 1836.

P.S. Quoting from Dr. Joseph Priestley, I have mentioned in the text that Aretæus flourished 300 years before Christ, but although we may concede to him the character of a good and accurate experimentalist, we cannot say so much for Dr. Priestley as an historian, for I am assured by my learned friends, Drs. Bostock and Willis, "that the Cappadocian physician lived in the time of Archigenes, and that it is certain that Archigenes flourished in the reigns of Domitian and of Trajan, consequently during the *last* 20 *or* 30 *years of the first century.*" See last German edition of Sprengel's Geschichte der Arzneikunde.

OBSERVATIONS

ON THE

CONSTITUTION OF THE URINE.

BY

JOHN BOSTOCK, M.D., F.R.S.

READ MARCH 14TH, 1837.

It is generally admitted, that our knowledge of the pathological conditions of the urine, or the relation which the changes in its physical and chemical properties bear to the morbid changes in the constitution, is not as considerable as might have been anticipated from the numerous experiments that have been performed upon it. This depends, I conceive, upon two circumstances; first, upon the nature of the fluid, as being the general excretion, by which all the extraneous substances are discharged from the system, which have been, from any cause, formed internally, or have been introduced ab extra; and secondly, from the great variety of causes, both external and internal, which affect the state of the urine, through the intervention of the vital actions of the system.

It has appeared to me, that these difficulties might, at least, to a certain extent, be obviated, by instituting a series of what may be styled statical experi-

ments, where the attention should be exclusively directed to a few well defined objects, the experiments to be all made precisely in the same mode, and consequently, admitting of direct comparison with each other. When a sufficient number of experiments shall have been performed on this plan, I would arrange them in tables, so that each particular point may be at once brought into view in the different cases under examination, and referred to the circumstances under which they were performed.

In the prosecution of this plan, the first step was to fix upon some term of comparison, to which the experiments might be referred, and, for this purpose, an individual of sound constitution and regular habits of life was employed as the standard. What may be regarded as the average healthy state of the urine of this individual was first ascertained, and afterwards the nature and amount of the occasional deviations, with the causes to which these deviations appeared to be referable. When this first object has been fully ascertained, we may compare this standard case with other individuals, noting accurately the differences of constitution, habits, &c., and connect these with the varieties in the fluid. Having accomplished these two points, we shall be prepared for examining the urine in the different states of disease; in all cases employing the same processes, and referring the results to the same standard.

It is obvious, that in order to arrive at any very important conclusions, it will be necessary that the experiments should be very numerous and varied,

and will almost necessarily require the cooperation of many individuals. On this account, I have endeavoured to render them as simple as possible, so that any one, who is disposed to prosecute the inquiry, can have no difficulty in performing the necessary operations. I have also adopted a distinct and well defined nomenclature, and I have been careful always to employ the terms in precisely the same mode. I consider the investigation as at present in its commencement only, but I have taken the liberty of laying my plan before this Society, in order that I might benefit by the remarks which may be made upon it, and still more, that I might engage the cooperation of any of its members who may be disposed to think favourably of it.

The circumstances which have been selected for experiments are the following; external characters, including colour, odour, clearness, specific gravity, &c.; degree of acidity referred to a fixed standard; presence and amount of albumen; amount of residuum after evaporation; proportion of residuum soluble in alcohol; amount of saline contents; amount of calcareous salts; and spontaneous changes.

As a specimen of the tabular form, in which I propose to arrange my results, I have subjoined a synopsis of some experiments that have been performed on the urine that was selected as the standard, to which, in the first instance, the others are to be referred.

1. Designation; time; quantity.	State of health; night; ℥x.	Lumbago; urgent calls; night; ℥xx.	Symptoms of gout; pain of feet; night; ℥xiv.	Gout gone; an interval of 2 days; night; ℥xij.	Lumbago; severe exercise; profuse perspiration, 2 P.M. ℥iv; urgent call.	Gouty symptoms, rather severe; exercise; more urine than ordinary; night; ℥xiv.
2. External characters; clearness; colour; odour.	Bright, clear, citron, urinous.	Transparent, light colour; faint odour.	Slightly opake; yellow; odour natural.	Rather brown; strong odour; bright and clear.	Clear, bright, light coloured.	Muddy, deep colour, inclining to brown; odour strong and unpleasant.
3. Specific gravity.	1014	10114	10066	1015	1007	1018
4. Degree of acidity.	6°	4°	4°	4°, after 8 days 12°	3°	6°; after 9 days 9°
5. Amount of solid contents per cent.	5·05	4·46	2·12	6·3	2·35	5·65
6. Proportion of solid contents soluble in alcohol.	2·6 of 5·05	2·6 of 4·46	.....	4·86 of 6·3	1·1 of 2·35	4·5 of 5·65
7. Effect of heat.	None.	Moderate precipitate.	None.	None, or rather brighter.	None.	None.
8. Effect of corrosive sublimate.	Opacity; when heated, dense flakes; 2·1 gr. per ℥.	Precipitate; when heated, light flakes; 1·8 gr. per ℥.	Precipitate; when heated, dense flakes; 1·35 gr. per ℥.	When heated, considerable brown precipitate; 3·1 gr. per ℥.	When heated, light flakes; ·8 gr. per ℥.	Perfectly opake; when boiled, considerable precipitate; 1·8 gr. per ℥.
9. Amount of precipitate by ammonia.	·5 gr. per ℥.	·8 gr. per ℥.	·2 gr. per ℥.	1·9 gr. per ℥.	·2 gr. per ℥.	·8 gr. per ℥.
10. Amount of precipitate by oxal. ammon.	·3 gr. per ℥.	·35 gr. per ℥.	·05 gr. per ℥.	·45 gr. per ℥.	·05 gr. per ℥.	·3 gr. per ℥.
11. Spontaneous changes.	In 2 days a light cloud; in 6 days less acid; somewhat opake and turbid.	Gradually became opake, and deposited a white crust; less acid in 6 days.	In 2 days considerably opake; in 4 days considerable deposit; became alkaline.	In 2 days quite opake, considerable deposit of light brown sediment, became much more acid.	In 4 days slightly opake; white sediment; less acid.	In 4 days a considerable quantity of pink and white sediment subsided, amounting to 1·5; the fluid, when filtered, bright and clear.

A DESCRIPTION

OF A

NEW INSTRUMENT

FOR CLOSING

VESICO-VAGINAL AND RECTO-VAGINAL FISTULÆ,

AND

FISSURES OF THE SOFT PALATE

INVENTED BY

WILLIAM BEAUMONT,

SURGEON TO THE ISLINGTON DISPENSARY.

READ MARCH 14TH, 1837.

THIS instrument* is in the form of forceps, one blade of which is a needle curved towards its point, and close to the point is the eye of the needle. The other blade is broader on its opposing surface, less curved, and at its extremity has a hole, through which the needle point and just the loop of the ligature are carried when the blades are closed. On the back of the broad blade is a spring, which, when pushed forwards, the blades being previously closed, catches the ligature on its point, and holds it at the extremity of the blade.

* See Plate 1.

In using this instrument the operator has only to seize in its points, as he would with a pair of forceps, the border of the fistulous opening; the blades should then be closed, and the ligature will be carried through one lip of the aperture. The opposite border is then in like manner to be seized, and the blades to be again closed and firmly held so. The spring on the back of the broad blade is now to be pushed forwards, by which the ligature will be caught and held at its point. The blades after this are to be opened and gently withdrawn, leaving a double ligature passed through opposite points of the fistulous aperture. A second or more stitches may in the same manner be made, leaving in each a double ligature, so that the quilled or other suture may afterwards be formed.

This instrument has been employed three times in operating for vesico-vaginal fistula. In the first case the aperture was situated at the neck and adjoining part of the bladder; its long diameter was transverse to the mesial plane, and the opening more than large enough to admit two fingers easily into the bladder. A single stitch was made about equidistant from the angles of the aperture, and a piece of bougie was placed within the loop of the ligature on one side of the opening, and another piece of bougie between the ends of the ligature on the other side, so that the silk, when drawn tight and tied, cut only on the pieces of bougie, and the latter pressed together the edges of the aperture. The formation of this suture occupied but a few minutes, and was

accomplished without the least difficulty. There followed no inflammation or other ill effects, and after three or four days the ligature was removed, (it had not cut its way through either lip of the opening,) when firm union was found to have taken place in the whole extent of the aperture save at one angle, where there remained an opening which would barely admit a crowquill.

In the second case, the fistulous opening was situated close to the os uteri, within a quarter of an inch, which rendered the paring of its edges extremely difficult, but the closing of them with the quilled suture was easily effected. Before the operation the patient's urine was at all times dribbling from her, but afterwards, although the whole of the opening was not closed, the bladder was capable of holding two or three ounces of urine, and the patient, by voiding it frequently, was rendered comparatively comfortable.

In the third case, the aperture was situated at the neck of the bladder. The edges were pared and closed by the quilled suture, which, for nearly two days, completely prevented any urine from dribbling away. The patient, however, suffered the catheter to get out of her bladder, which became distended, and she by the ordinary voluntary effort voided a large quantity of urine through the urethra. Soon afterwards the urine again began to dribble from her, and three days after the operation the ligature was found to have cut its way through one lip of the fistulous aperture. The total want of

success in this case was, no doubt, owing to the catheter being allowed to remain out of the bladder, which alone, however favourable all other circumstances might be, would probably in any case prevent union taking place.

FACTS AND INFERENCES

RELATIVE TO THE

CONDITION OF THE VITAL ORGANS

AND

VISCERA IN GENERAL,

AS TO THEIR

NUTRITION IN CERTAIN CHRONIC DISEASES.

By JOHN CLENDINNING, M.D.,

PHYSICIAN TO THE ST. MARYLEBONE INFIRMARY, AND ONE OF THE SECRETARIES OF THE SOCIETY.

READ APRIL 11TH, 1837.

TAKEN in its largest sense, the function of nutrition may, I think, be considered as the leading function of the animal body. With the exception of the brain, there is no viscus whose principal if not exclusive business is not the reception of the raw materials of nutrition; or their subsequent elaboration; or ultimate transport and distribution in the form of food, or of chyle, or of air, or of blood; while the encephalon, skeleton, and muscular apparatus are all more or less subservient to nutrition as scouts and purveyors; as hewers of wood, to use a familiar saying, and drawers of water. It is only in the higher animals that the predominance or supremacy of the nutritive function

becomes in any degree questionable, and more especially in man, in whom the wide range of influence, and the complicated relations of the sensorial forces, have apparently, to many enquirers, rendered unavoidable the hypothesis, that at a certain stage in the scale of organized beings, the nutritive function, previously supreme, becomes thereafter subordinate, and for every impulse necessary to the commencement, continuance, and completion of all its processes, dependent upon emanations from the nervous structures.

Viewed in its pathological aspect, the nutritive function is not less important as an object of study, than in its relations to normal organic structure and action. If we separate diseases into two groups, the first including all such as involve as a principal element some important lesion of the nutrient function, we shall have in the second group few leading acute diseases, and almost no dangerous chronic ones. This paramount importance of nutrition, or in other words of the proper formation, distribution, and disposal of blood, it appears to me, becomes every day more obvious. The humoral pathology of ancients and moderns alike, seem to be practical expressions of the conviction impressed in all ages upon physiologists and physicians, that health and disease depend greatly on conditions originating with the fluids; and in recent ages, experimental physiology, morbid anatomy, and chemistry have co-operated in establishing similar views on ample inductions and the most accurate data. Increased afflux and stasis of

blood are now known to be essential conditions, or elements, in one or more stages of almost every important vital action, whether healthy or morbid. Normal depositions and secretions, also, undoubtedly are for the most part contingent on a peculiar appropriate crasis of the fluids, while abnormal formations, solid and fluid, are to an equal extent dependent for their production on humoral disease.

There is probably, therefore, no function, or perhaps in deference to usage, I should say, no group of allied functions, respecting which every attainable illustration and elucidation is more important to the physician than nutrition; and this is probably peculiarly true as it regards a certain class of diseases, some slight contributions to the history of which it is the object of this paper to submit to the Society,—I mean diseases of the heart and lungs. Over-nutrition, or hypertrophy of the heart, is generally known to be one of the most frequent diseases of that organ, and one of the most common of fatal diseases; and inflammation, tuberculation, &c., of the lungs, and emphysema pulmonum, (to use Lænnec's name for hypertrophy, with dilatation of the air-passages and air-vesicles,) are diseases of notoriously daily or even hourly occurrence in certain walks of practice. But inflammation, and still more obviously hypertrophy, are, so far as the fluids are concerned, but deviations in plus of the afflux and stasis of blood that always attends active or excited nutrition; and tuberculation, &c., is as plainly a result, principally if not exclusively, of vitiated nutrient action.

Under such impressions, it has occurred to me that the following facts and inferences might be deemed not unworthy of the attention of the Society, as illustrations of the modifications of nutrition attending certain of the most frequent and fatal chronic diseases.

The facts which I am about to state have been collected with objects, in some measure, different from those for which they are now brought forward; they constitute, in fact, part of an as yet incomplete, although already pretty numerous series or collection of facts, intended, at a later period, to be presented to the Society, in illustration of a class of diseases which, I suspect, destroys more adult male life than any other, pulmonary consumption not excepted—namely, diseases of the heart; a class of diseases which, I imagine, is the main cause of the great bulk, if not of the whole, of the sufferings and mortality ascribed by authors to numerous chronic diseases; viz., to asthma; to chronic catarrh; to dropsy, including anasarca, ascites, and hydrothorax; to emphysema pulmonum; to chronic hepatic diseases, and to various affections denominated *phthisis catarrhalis, catarrhus suffocativus, dyspnœa chronica, tussis senilis,* winter cough of mature years, miliary tuberculation of the lungs, &c.;—also of no small part of the gravity and fatality of acute diseases of all the great viscera in adult subjects, but more especially of those of the lungs, as well as of typhus and other continued fevers.

In proof of the positions just glanced at, and of

some others in the same department of pathology, the writer hopes, before long, to be provided with sufficient data from authors and from his own observation; and begs, meanwhile, for the indulgent consideration of the Society of an attempt made under some disadvantages of haste and imperfect preparation, to reply partially to a question to which the writer had not originally intended, at least in a direct manner, to address himself; viz., the question, What are the modifications impressed on the nutritive functions in the viscera in certain chronic diseases? Does (ex. gr.) the defect of supply or excess of waste proceed in the same manner amongst the external and internal parts in phthisis? Does hypertrophy of the heart beget or indicate a general or partial tendency to hypertrophy? &c., &c.

In answer to the questions just proposed, I proceed to offer some facts and observations. The facts I have to state consist principally of measurements by weight of nearly all the principal viscera in most cases, and of the person in many, of 249 subjects, of whose diseases and post mortem appearances I am in possession of memoranda, taken, with a few exceptions, by myself. They are arranged in tabular form as follows.

Table 1 contains, in separate columns, the weight of the encephalon, heart, liver, kidneys, spleen, and pancreas of each of 31 males, dead of various known diseases, not *phthisis* or *morbus cordis*, between 21 and 60 years of age.

Table 2 contains like particulars of 44 females, dead under like conditions as to disease and age.

Table 3 contains like particulars of 37 males dead, not of *phthisis* or *morbus cordis*, at ages above 60 years of age.

Table 4 contains the weights of the hearts of 33 females of various ages above 60, and dead of various diseases exclusive of *phthisis* and *morbus cordis*.

Table 5 includes particulars arranged as above, of27 males, dead of *phthisis* between 21 and 60 years of age.

Table 6 gives like particulars of 16 females, dead under similar conditions of age and disease.

Table 7 contains particulars, tabulated as before, of each of 41 males, dead of *morbus cordis*, between 21 and 60 years of age.

Table 8 contains for 20 females, dead of the same disease, and between 21 and 60, the like particulars.

In most of those tables the weights, in more or fewer instances, are given for the person and the stomach, and of nearly all cases the diseases are recorded.

With respect to the mode of obtaining the weights, it is proper to explain, that where the weight of the person is given, it comprehends the whole person, the viscera included. It was ascertained by means of a steel-yard and must be accurate, although, I confess, that I often at first suspected important errors in the use of the instrument, owing to the instrumental weight differing so much, falling, in fact, so far

short of the apparent weight, judging by the eye. The visceral weights are all avoirdupois, and were all ascertained by means of a balance, and are generally correct to within half a drachm. With regard to the results of weighing by the balance also I may mention, that I have often been surprised at the errors of my visual and manual estimates; errors like the former with the steelyard, generally much in defect and rarely in excess, and so difficult to avoid, that I confess I should feel little confidence in any estimate of the organized contents, or in other words, of the quantity or density of any viscus not tried by some test less fallacious than visual or manual estimate, except, of course, in case of very great and obvious excess or defect of quantity, which must necessarily be readily detected, although it could not, I believe, be measured with pretensions to accuracy without instrumental aid.

I may further mention, that before placing the viscera in the balance they were carefully separated from their appendages—the brain or encephalon and heart from their outer coverings—the liver, spleen, pancreas, kidneys, and stomach from fat, cellular substance, peritoneum, and other extrinsic parts; in fact, from all parts that were not included within the *tunica propria*, or that might in any way materially affect the result. The brain or encephalon, heart, and stomach were usually sliced, washed, &c., and the other viscera were generally similarly treated when congested or otherwise open to just suspicion.

Now the inspection of those tables suggests more than one conclusion more or less at variance with prevailing opinion, and which, waiving for the present any reasoning pro or con, as to the materials or principles of construction of the tables, I shall proceed to specify.

Assuming for the present, that Tables 1, 2, 3, and 4, furnish averages not considerably different from the true average weights of the organs of males and females between 21 and 60 (Tables 1 and 2); —of those of males above 60 (Table 3);—and of those of the hearts of females above 60 (Table 4);— the subjects in every Table having been free from *phthisis* and *morbus cordis;* we shall then have the following normal average weights of the viscera.

In males between 21 and 60, and not labouring under consumption or disease of the heart, the average weight of the

Brain ..... will be	46¼	oz. or	20226	grains.
Heart	9 1/10	„ or	3982	grs.
Liver	53½	„ or	23408	grs.
Kidneys	9⅛	„ or	4025	grs.
Spleen	5	„ or	2188	grs.
Pancreas	2⅝	„ or	1148	grs.
Stomach	5	„ or	2188	grs.
Lungs	46	„ or	20116	grs.
Person	94½	lbs. or	661500	grs.

whereas the weights in phthisis, according to our 5th Table, are, for the

Brain.....	46⅓ oz.	instead of	46¼
Heart.....	9⅙	.....	9 1/10
Liver	58½	.....	53½
Kidneys....	10¼	.....	9⅕
Spleen.....	7½	.....	5
Pancreas...	3	.....	2⅝
Stomach...	5½	.....	5

Yet the average of the phthisical subjects weighed, though adult males, was under 94 lbs. avoirdupois, or nearly 48 lbs. less than the average obtained for the healthy male of 40 years, by the great statist of Brussels, M. Quetelet; so that the defect of supply or excess of waste, popularly known to affect the external parts, does not, always at least, extend to the interior in like manner in phthisical subjects; but on the contrary, the viscera would appear to enjoy a singular exemption amid the apparently general ruin, and to be enabled to receive and assimilate the usual supplies of nutrient fluids.

This result is of some interest, inasmuch as it clashes with the conclusions of several most accurate observers and weighty authorities; such as (*ex. gr.*) Louis, of La Pitié, who in his admirable work on Phthisis, speaks only of the liver and stomach as frequently enlarged, and declares that in the majority of cases the heart is less than natural; while it does not appear that he, or indeed any other pathologist, with a few partial exceptions, has employed the steelyard or balance in any of his post mortem examinations. It also, I imagine, clashes with the general impression that the wasting is general—an impression

suggested, doubtless, by the havoc made by phthisis in the organs of locomotion and other tangible and visible parts. Similar conclusions follow from a comparison of the 2d and 6th tables, containing, the former, particulars of 44 females, dead of various diseases, not phthisis or heart disease, the latter containing like particulars of 16 females dead of phthisis, the subjects of both Tables being between the ages of 21 and 60. From those Tables it appears that, as in males, so in females, the viscera of phthisical subjects do not participate in the apparently general waste, but thrive as usual nearly, notwithstanding fever, colliquative discharges, and protracted suffering.

The average weight of the whole subject, in the former female Table was 82 lbs., that of the phthisical females was 66 lbs., or more than a stone less than the former: yet, in most of the organs, the average weight was higher in the phthisical than in the other subjects.

It would appear from the preceding facts, that in a most important class of diseases, whether as to frequency or fatality, and which are pre-eminently characterized in general estimation by excess in the processes of waste, namely, phthisical diseases; such wasting is not general but partial; that it falls upon the organs of locomotion and external parts principally, if not exclusively, and that the viscera, which as the seats of the principal vital actions might be supposed to be amongst the parts most nearly concerned, and most deeply and extensively injured, are still by no means sufferers to the extent or in the manner with so much apparent reason assumed; that

none of the vital organs in fact suffer any abridgment of their usual supplies, and that, amid the apparently general denudation and dissolution, the great organs of life receive and assimilate even a larger than normal portion of the circulating nutriment. Nor is the immediate seat, and, so to speak, pabulum of phthisis, namely, the pulmonary structures, I have reason to think, any exception to the preceding general observation. From trials, as yet partial, I have little doubt, that in phthisis, the lungs receive and convert into their own substance not less, but much more than the regular quantum of blood; and that if they suffer loss in bulk or weight, it is from no want of nutriment supplied nor from any sluggishness in the business of assimilation, but from the preponderance of disintegrating processes peculiar to their structure, and which art will one day, I doubt not, know how more effectually than at present to restrain.

If fatal phthisis be, as waiving sympathetic functional disturbances, it would appear to be, essentially a local mischief; if with regard to its point of fatal attack, it be confined to the lungs, although indicating probably a constitutional propensity; if, amid all the waste of external non-vital organs and the vitiated nutrition of the pulmonary structures, the vital organs in general may, as they not unfrequently do, retain their normal structures and capacities; may we not hope that, in some future year, we shall learn to control the disintegrating processes, and correct the depraved nutrition, and heal the structural

lesions, and re-establish the functional capacities of the phthisical lung, with as much certainty and facility as we already experience in the cure of several diseases formerly very fatal, but now, in a large majority of cases, remediable by our still very imperfect therapeutical resources.

Dismissing now for the present Tables 5 and 6, or those of phthisis, and turning our attention to Tables 7 and 8, or those of morbus cordis, we find still greater deviations from the law of normal nutrition. If we compare Tables 7 and 1, the former containing average weights for males, and founded on forty-one observations; the latter often already referred to as our standard of health for males; we find that under every head, without exception, there is an excess in the former; the brain being in the morbus cordis Table about $\frac{1}{25}$th heavier than our standard—the heart being $\frac{2}{5}$ths heavier, the liver $\frac{1}{9}$th, the kidneys $\frac{1}{4}$th, the spleen $\frac{4}{5}$ths of an ounce heavier; the pancreas $\frac{1}{3}$th of an ounce; and the stomach also heavier than the standard.

When I first observed the superiority in bulk or density, but generally in both, of the organs of subjects dead of chronic diseases of the heart or *morbus cordis*, I attributed it to accident so far as it related to the brain and most of the abdominal viscera. Every one is aware that in the lottery of facts and observation, there occur from time to time trains of coinciding phenomena, that suggest conclusions which are falsified by subsequent larger and more varied experience. I had no doubt at first that something of that kind

was the source of the apparent superiority of weight of the viscera of the sufferers from chronic heart affections; however, I found that more ample experience confirmed, instead of invalidating the suspected results. On referring to the Table 8, that of morbus cordis in females, which is deduced from thirty observations, and comparing that Table with Table 2, our standard of health for females, results will be obtained almost the same as those from the male Tables. The brain of the female dead of morbus cordis was found heavier than the standard about $\frac{1}{14}$th, the heart nearly $\frac{1}{2}$ heavier, the liver $\frac{1}{12}$th, the kidneys $\frac{1}{8}$th, the spleen about $\frac{1}{4}$th, the pancreas $\frac{1}{5}$th, the stomach more than $\frac{1}{4}$th, and the person nearly $\frac{1}{5}$th heavier. So that the female table fully confirms the male, and even with enlargement, as including the stomach and person, which are deficient in the first male table, or Table 1.

The conclusions to which the preceding Tables lead, are likewise confirmed to a certain degree by various incidental notices, to be found in writers on chronic pectoral diseases, especially those of the heart. In such diseases, the liver has often been found enlarged, and in many instances, the spleen. In a comparatively few cases, also, the kidneys have been observed larger than normal. It is true, that the writers have, in most instances, attributed such enlargement of the abdominal viscera as they have recorded to chronic inflammation, or to mere congestion and distention of the blood-vessels, owing to regurgitation or obstruction from the circulation in the lungs

or in the heart; while, in a few cases, the pectoral disease has been attributed to the abdominal visceral enlargement. But independently of explanations or explanatory conjectures, the fact of the connexion or coincidence between morbus cordis and hepatic and splenic and renal enlargements is so far capable of verification from the writings of several distinguished authors. Amongst the writers, to whom especially I allude, I may mention Andral, Cruveilhier, Bouillaud, Abercrombie, Hastings, Copland, Hope, Latham, and Dr. Bright, amongst the more recent, and Morgagni, Lieutaud, Portal, Corvisart, Kreysig, Testa, and Bree, amongst authors of longer standing. Another circumstance often met with, or rather seldom wanting in the anatomical descriptions of writers on pectoral diseases and pathology, is this—that in subjects dead of chronic complaints marked by dyspnœa, chronic cough, asthma-like paroxysms, dropsy, &c., there have been, in a great majority of cases, traces observed of pulmonary or pleuritic inflammations and active congestions. And these indices of pulmonic disease occurred in numberless cases where no disease of valve or orifice seems to have existed, and where the left ventricle had been the principal seat of any alteration, usually hypertrophy, that was discovered in the heart. Now a heart deviating from normal structure merely by increase of power and capacity of its left ventricle, differs, it would seem, from the healthy heart, especially in this,—that it would supply blood to all the organs in larger quantity, and send it with more force than normal;

and such a state of things would obviously favour as a predisposing or exciting cause, as circumstances might determine, the establishment of inflammatory processes in all the organs, and very especially in the lungs, and might further be expected under ordinary circumstances to predispose to plethora and hypertrophy of the viscera not less than of the whole body. Accordingly, I have found in the few trials I have had opportunity of making since I included the lungs in the number of viscera subjected to weighing, that the density of those organs also is usually greatly increased in morbus cordis, more especially in cases of great hypertrophy of the left ventricle.

In many cases, no doubt, much of the heavy, firm, non-collapsing condition of the lung in cardiac and asthmatic diseases, is owing to œdema, and may be much reduced by incision and pressure. But in many trials on the lungs of cardiac subjects, I have not succeeded in getting rid of unequivocal traces of hypertrophy, or restoring normal spongy softness and lightness to the organs. I have in almost every instance found in chronic diseases of the heart, more especially in adult males, that plethora had existed and hypertrophy taken place in the branches of the air-tube; this is more particularly true of victims of heart disease that had survived the 40th year, among whom I do not know that I have met with a single satisfactory exception, amongst many scores, to the rule that chronic over-nutrition and enlargement of the left heart is attended by hypertrophy of the ramifications of the bronchus. Sometimes the hypertrophy, I have

observed, is accompanied by dilatation, and constitutes Lænnec's emphysema of the lungs. But sometimes, also, it is unattended by any expansion, or is accompanied by contraction, so that the air passage becomes nearly or wholly impervious; and this state of the bronchial twigs or branches seems to me to have been often mistaken for tuberculation, which it not a little resembles, and to have in consequence been called grey or miliary tuberculation. Into this, as it appears to me, erroneous view of the nature of a state of the lungs which is very common, and in adult males more common, I suspect, than true caseous tuberculation, have, in my judgment, fallen many of the first pathologists, amongst whom I would include the illustrious Lænnec.

Excessive supply of arterial fluids, therefore, by an enlarged left ventricle, may be supposed in numerous cases of heart disease to be the cause of much visceral disturbance and vitiation, not in the lungs merely, but also in the contents of the head and abdomen. But there is another element less obvious, but probably more extensively operative, and therefore more important than excess of arterial supplies, viz., a gradual alteration of the normal susceptibilities of the viscera, owing to which they become capable, without injury of sustaining habitual venous congestion, and at length are enabled to resume, so to speak, their fœtal conditions, so far as to assimilate indifferently venous blood or the imperfectly renovated fluid brought back from the unhealthy lungs by the arteries. This assimilation of venous blood is, I imagine, the principal cause of the

regular visceral enlargement and frequent inflammations attending morbus cordis chron., as appears from this, that it obtains, though not with equal frequency, —1. where the left ventricle only is affected; 2. where both sides of the heart are affected; 3. where, in addition to hypertrophy, there is dilatation; 4. in the opposite case of concentric hypertrophy; 5. where, in addition to hypertrophy, with or without contraction, there is valvular defect, and consequently, of mechanical necessity, constant regurgitation. In the case No. 5, assuming the assimilability of venous blood, there is no difficulty as to the mode of over supply; which, however, in the other cases of at least apparent valvular sufficiency, is less obvious, though, as I apprehend, not less real; and may, I imagine, be thus summarily stated:—the heart and lungs, with their increase of nutrition and substance, acquire no additional, or not any adequate additional vital or organic power; and the blood is less efficiently propelled by the one, and less completely aerated by the other, than in health; while the crude materials of the fluid are supplied in relative excess by an often very active digestion; and thus all the conditions of plethora and stasis of blood, both material and dynamic, are afforded, and visceral congestion becomes habitual, and visceral hypertrophies and inflammations result, as frequent and embarrassing complications.

Assuming for the present, that I am correct in my facts, and just in my reasoning, in the preceding pages, it may be asked—"How has it happened that

preceding inquirers have failed to arrive at similar results? more especially recent pathologists, whose attention has been much directed to the causes, characters, and consequences of diseases of the heart and lungs?"

To this question I would reply, in the first place, by stating, that the results in question have been, at least partially, attained by several preceding writers. I have already mentioned, that several authors have noticed the connexion between diseases of the respiratory organs, of an asthmatic and catarrhal kind, and chronic affections of the heart; also, that the coincidence of enlargement of the liver and spleen with heart disease, has been recorded by many observers. A tendency to cerebral disorder of a fluxionary, or at least hæmorrhagic kind, has been likewise observed, by several pathologists, to beset the subjects of hypertrophy of the left ventricle of the heart in advanced life; and one of the most recent writers on the heart (I mean Dr. Hope) has, more nearly than any other that I know, approached the results to which I have come, by stating generally that hypertrophy of the left ventricle predisposes to apoplexy, cerebral inflammation and irritation, and to inflammatory action in general; also, he adds, to headaches, brain fevers, and various inflammatory complaints and states of nervous irritability and excitation.

And I would reply, in the second place, that the means employed by post mortem inquirers have, as I apprehend, been usually insufficient for the detection

of any other than broad, large, and in a word, very obvious deviations from normal size or density in the viscera; so that, in my judgment, a considerable proportion of the visceral hypertrophy, occurring within their spheres of observation, has unavoidably escaped their notice. Of this, in fact, I conceive there can be no well-founded doubt, as it respects those anatomists who have made no use of instrumental means of admeasurement, and have trusted wholly to their unaided touch and sight, as tests of normality of condition.

I would here say a few words as to the best means of measuring parts in pathological inquiries.—There are but three sorts of measures available for anatomical purposes; viz. 1. linear measure, 2. measuring in water, and 3. by weight. Now, on the large scale, I apprehend, linear measurement will hardly apply. Indeed, the practical difficulty alone of fixing the linear limits of irregularly shaped bodies, as the pancreas, liver, stomach, lungs, &c., is of itself sufficient to make us pause—and if further the degree of hardness, elasticity, &c., is to be recorded, in the case of every organ, I apprehend, if linear measurement be the only one employed, some other tests than length and breadth, thickness and circumference, will be necessary to mark the degree of density and nutrition;—then I see no means of insuring accuracy, but such as would be too troublesome for regular employment under almost any circumstances.

Measurement by volume in water I have not yet

sufficiently tried, so that at present the balance appears to me, as a means of measurement, very much the most easy of application, and at the same time practically the most accurate, especially in investigations conducted on a considerable scale, and yielding crude results in considerable masses, intended also, perhaps, for exposition in tabular forms. In this opinion, I have the pleasure to perceive that I have the sanction of one of the most distinguished pathologists of this country—I mean Dr. Carswell, of University College. In a recent number of that able writer's work on Morbid Anatomy, he declares it to be his opinion, that of hypertrophy of the brain, liver, kidneys, heart, and other hollow organs, the best test is the weight.

There is another result of the preceding measurements which I would notice before concluding these observations. It is the comparative states of nutrition, as indicated by weight, *at different ages*. If we compare Table 1 with Table 3, we shall find that, according to my observations, advanced life is accompanied by shrinking or loss of substance in the case of every organ examined, with the single exception of the heart. The brain of males above 60 years of age appears from those tables to be about $\frac{1}{15}$th part lighter than that of adult males below 60 years of age; the liver about $\frac{1}{12}$th lighter; the kidneys $\frac{1}{6}$th lighter; the spleen $\frac{1}{2}$ lighter; the pancreas about $\frac{1}{3}$d lighter; and the person generally of course, though not noticed in both tables, much diminished in bulk and weight. The heart, however, instead of diminishing with the person and the viscera, gene-

rally seems to increase, and in the instances occurring to myself as above stated, to have exceeded on the average the normal standard by about $\frac{1}{12}$th part.

Now such a result I was not prepared for, and accordingly attributed to accident, or, more statistically speaking, to too great paucity of instances for a true average. I find myself, however, quite unexpectedly supported in the conclusion to which I was led, by one of the most unexceptionable guides to truth in physic, I mean figures, from perusing an Essay on the Heart and Arteries, contained in the Mem. de la Soc. Med. d'Observation of Paris, of which Dr. Bigot, of Geneva, is the author. From Dr. Bigot's researches, which seem to me the most accurate, and in some respects the most valuable extant, it appears that the nutrition of the heart increases steadily as life advances. His measurements were exclusively linear, which is perhaps unfortunate, but from the number of subjects examined, and the pains taken in examining, it is impossible, I think, to refuse our confidence to his results; for which, if I do not mistake, we have likewise in some measure the authentication of the cautious and accurate Louis, whose pupil the author seems to have been, and who is perpetual president of the association in whose Transactions the memoir is published. Dr. Bigot's Essay does not contain the measurements themselves, but gives averages of the length, breadth, thickness, and circumference, of the organ, its walls, cavities, and orifices, at six different intervals of age, in both sexes and in various diseases; and all ar-

ranged in tabular forms. The general result of his researches is, that the heart increases in both sexes, not uniformly indeed, but constantly, in all its linear dimensions, from birth to extreme age.

Having quoted Bigot's Researches, as confirming my own results, as respects the increase of the heart's nutrition with increasing years, I think it necessary to mention, that the same author has arrived at results different apparently from mine, with respect to the state of the heart in phthisis. According to his observations, the linear dimensions of the heart are, cæteris paribus, in every way less in that disease than under other circumstances, an opinion in which he is supported by Louis. Professor Andral, however, must have obtained results more nearly agreeing with those above stated, since he informs us that in two thirds of his cases of fatal phthisis, he found the heart more or less altered in dimensions, and exceeding the normal size.

I might also notice the preceding tables, Nos. 1, 2, 5, 6, 7, and 8, as illustrating the influence of sex, in modifying organic nutrition, as it appears from them, that whether in health or disease, there is in the male a greater development, arising of course from a more abundant nutrition, in the case of every organ examined, and that the excess on the side of the male, or, what is the same thing, the deficiency on the side of the female in disease of the heart, or phthisis, bears about the same proportion to the total weights of the encephalon of the other sex, that is found to exist in other diseases. This is

an inference that might reasonably have been anticipated, but yet needed experimental proof. The inferior dimensions of the female person do not by any means necessarily imply corresponding visceral differences. This appears from several facts: Bigot, for example, found that the linear dimensions of the heart of 30 males of 60 French inches in height and under, exceeded those of the hearts of 30 males of 60 inches in height and upwards; and he found the same rule nearly equally applicable to 18 females of 55 Paris inches stature and under, as compared with 34 females of 55 inches in height and upwards: and I have myself obtained similar results by a different method.

With respect to the influence of age upon organic development and nutrition, as measured by weight, I am as yet scarcely provided with a sufficient number of data, excluding cases of disease of the heart; and on account of the hypertrophous condition of the viscera attending, or, as I conceive, occasioned by heart diseases, I think that by including them I should obtain average weights erring so considerably in excess, as to have no pretensions to accuracy; and this holds more especially of mature years and declining life, which are so much more liable to simple hypertrophy of the left ventricle, and the consequent abnormal modifications of visceral nutrition.

The following general inferences might be deduced from the preceding facts, if their accuracy and number were considered sufficient.

1. That the healthy adult male heart averages,

for all ages under 60, nearly $8\frac{1}{2}$ ounces avoirdupois.

Note. This estimate agrees pretty well with the estimates of Senac, viz. 8 to 10 oz.; Bouillaud, 8 oz. and 3 grs. average; Cruveilhier, 7 to 8 oz. average; and Lobstein, 9 to 10 oz. average; considering that Senac and Lobstein made, as I recollect it, no distinctions as to age or sex; while Bouillaud included in his estimate several hearts of subjects under 21 years of age, and Cruveilhier included subjects of various ages above 16 or 18, and of both sexes.

2. The healthy female adult heart averages nearly $7\frac{1}{2}$ ounces, or, more exactly, $7\frac{2}{5}$ ounces.

3. In phthisical subjects, the heart, in a large proportion of cases, (according to my observation,) weighs considerably more than in health.

4. The weight of the heart increases with years, up to the end of life, contrary to the law of nutrition of the viscera in general.

5. Hypertrophy of the heart generally, or of the left ventricle alone, predisposes not only to visceral and general plethora and hypertrophy, but also to acute and chronic inflammations in general, and especially to bronchitis, pneumonia, and pleurisy,—and the tendency it produces to disease of the bronchial ramifications in particular, and of the air vesicles, is such that cases of long standing are usually, if not invariably, complicated with chronic catarrh and emphysema of the lungs.

6. The average weight of the brain of the healthy

adult male under 60 years of age is about 45·85 ounces: that of the healthy adult female under 60, about 41·25 ounces.

(*Note.* This is rather lower than the estimate of Dr. Sims, contained in his valuable paper in the 19th volume of the Transactions, which, for both sexes and all diseases, from 20 to 60 years of age, gives an average of about 45 ounces. But the estimate of Dr. Sims being founded on more than 100 observations of subjects between 20 and 60, is, in all probability, better entitled to confidence than mine, although taking no account of other difference than that of age.)

7. The weight and consequently nutrition of all the viscera exceed the normal standard in all cases of phthisis, in which the heart is increased in bulk or weight.

8. That in post mortem inspections, more especially of cases of diseased heart, but also in other cases of which hypertrophy of any viscus might be supposed an element or complication, it is advisable, in addition to manual and visual examination and linear measurement, to employ other means, such as weighing, to ascertain accurately the state of nutrition and density of the viscera, and perhaps of the person, in order to avoid the risk of overlooking important deviations from the normal condition, not otherwise so readily and surely to be detected.

To conclude. There are other inferences, and some too of a grave practical character, to which the facts stated or referred to in the preceding pages

would naturally lead me, if I felt myself at this moment provided sufficiently with materials for entering upon questions not to be decided on without the aid of more extensive reading and observation, and more mature reflection than are now at my disposal.

Such, for example, are the relations of the renal disease made known to us by our distinguished President; and the form of consumption, called hepatic phthisis by Dr. Wilson Philip, to hypertrophy of the heart. With regard to those and other questions, probably the Society may, on some future occasion, permit me to engage its attention.

TABLE I.—Males, 21 to 60 years of age. Various diseases, exclusive of Phthisis and Morb. Cord. Chron.

No.	Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Lungs.	Stature.	Weight.	Diseases fatal.—Remarks.
	Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz.	oz.	ft. in.	lbs.	
1	35	42½	9¾	51	8½	3	3½	..	..	5 11	..	Mania.
2	35	48	7½	47	11½	8¼	..	..	..	..	..	Disease of the thigh. Middle size; wasted by
3	30	50	8¼	48	10¼	5 6	3 10	..	..	..	..	Cholera. [hectic.
4	47	..	6¼	55	12 10	4½	3¼	..	..	..	..	Pleuritis and Pericarditis.
5	28	47	8½	65	9 6	5 14	..	..	..	..	..	Pneumonia and Delirium.
6	35	47	9¾	50	9 6	6 2	4	..	..	..	..	Maniac and Phthisical. Died of Pneumonia and
7	52	40½	8½	53¼	5	4 5	2 2	..	..	..	..	[Arachnitis.
8	32	..	8½	72½	12½	5½	2	..	..	..	..	Cancer.
9	24	51½	6	154½*	11	42½*	2 7	..	..	..	..	Ascites.
10	46	47½	10½	113*	..	very larg.	..	..	..	..	..	Pleuropneumonia.
11	35	..	7½	51	9¼	3½	2¾	..	..	..	..	Pneumonia.
12	58	45	10	40	4	4	..	..	..	..	..	Morb. Chron. Cerebri, Renum, &c.
13	28	47	8½	65	9 6	5 14	..	..	..	..	..	Pneumonia c̄ Delirio.
14	57	45 10	10¼	58¾	11 7	12*	3	..	..	5 9	104	Admitted moribund. Viscera sound.
15	60	52¾	12	74	12½	4 13	1 10	..	..	5 10	124	Pleuropneumonia duplex.
16	52	43 3	13 4	57½	7½	6 13	3 6	5 11	..	5 6	113	Influenza. Pneumonia.
17	36	48½	11¾	70½	8 14	2½	3 15	4½	..	5 3	111	Mania.
18	44	48½	10¾	45½	7¾	2½	2 2	4 6	..	5 8	125	Mania.
19	38	44½	10½	44	9¼	6½	3	5¼	..	..	..	Bronch. Chron.
20	41	49½	6	38	7½	2	1½	6	44	5 8	78	
21	41	49½	6	38	7½	2	1½	6	44	..	78	Mania.
22	48	45 7	6½	41¾	9	6	2¾	5	59	..	83	Bronchitis chronica.
23	59	46¾	10½	45	6	2¼	2 15	3½	45	..	91	Bronch. Chron.
24	50	39½	8½	51½	8	4¾	2¼	3¼	52½	..	68	Uncertain.
25	22	47¾	8¾	52½	8½	7	2½	4	38¾	..	93	Apoplexy. Pneumonia.
26	46	49	12	75½	12½	4	3	6½	86	..	126	Peripneumonia.
27	37	40¾	7¾	56	11½	6	3	6	40	..	90	Pleuritis. Peritonitis.
28	36	41½	8	41	8	3	2	4½	40	..	85	Gangræna Pulmonum.
29	24	50½	10½	76½	10	8½	3 2	6	36	..	100	Typhomania.
30	38	41¼	10	47¾	7 2	3½	1½	4¾	49½	..	69	Pneumonia.
31	33	49 9	9	45½	7¾	5½	2 5	4½	34½	..	70	Typhus.
Totals.....		1300	281	1558	272	145	68	80	..	..	..	
Averages...		46⅓	9⅓	54†	9⅛	5	2⅜	5	46	..	94½ lbs.	† Nearly.

The numbers marked with asterisks, in this and the next Table, are omitted in the total; since, being instances of unusual enlargement, they would disturb the average results.

TABLE II.

FEMALES, 21 to 60 years of age. Various diseases, exclusive of Phthisis and Morb. Cord. Chron.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Lungs.	Stature.	Weight.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	s. dr.	oz. dr.	oz. dr.	ft. in.	lbs.	
30	43 4	9	39	9¼	6	1 14	4 12	..	5 1	84	Pneumonia & Delirio.
26	46 3	10 2	74*	7⅞	7½	3¾	7	..	5 2	110	Peritonitis Puerp^{m}.
36	..	8 4	40	9	3	2 12	4 4	..	5 3	70	Mania Fatuitas. Tumor cerebri.
24	43¼	9½	58½	10¼	..	1 11	4⅝	..	5 1	90	Peritonitis Puerp^{m}.
40	43½	10 12	51	7 12	4 14	1 14	4 2	..	5 8	90	Mania. Grey softening of left lobes, &c.
41	43½	8	50⅝	5 15	2 8	2 4	4 8	..	..	..	Abscess axilla. Pleuritis. Arachnitis.
28	44 4	8¼	39½	8	3 6	2 4	4 7	..	4 11	82	Mania ferox.
60	44⅜	7 4	39 12	8 15	2 12	2	2 6	..	5	78	Bronch. Chron. Pneumonia, &c.
43	37½	7 14	44⅜	9¼	4⅜	2 10	..	..	4 9	78	Pneumonia duplex. Recently delivered.
18	42½	8 10	79*	12	4½	1 14	5½	..	5	80	Puerperal hæmorrhage.
24	31	6⅜	42½	8½	3	..	..	..	..	..	Morb. Chron. Cerebri. Ulceration of Colon.
52	37 13	6	33½	6⅜	8¼*	1⅛	..	..	4 6	65	Diarrhœa. Chronic Colitis.
50	42½	7	46½	8 10	4 7	2 13	..	..	5 5	70	Carcinoma Uteri.
50	41½	6⅜	37½	9	2 10	1 13	..	..	5 6	83	Paralysis.
56	43	6½	36¼	4 13	2 13	1 14	..	..	5	67	Erysipelas Faciei.
49	42 10	6 2	31½	7	4½	2 7	..	..	4 6	56	Disease of the brain.
20	43	5½	42½	6¼	3	15	..	..	4 9	56	Typhus.
22	..	8 11	41	7¼	4	1 15	..	..	..	..	Drowned.
43	44	7½	66	17½*	7½	3	..	..	..	..	Pneumonia. Pericarditis.
31	..	5	50	..	5	1 2	..	..	..	..	Wasted; middle size. Bronch. Chron.
40	42	6	25	8	10*	..	..	..	..	..	Apoplexy. Concentric hypertrophy of left ventricle apparently.
45	34	8¾	51½	9⅜	4½	3 2	..	..	..	..	Fatuitas. Gangræna Cerebri.

TABLE II. CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Lungs.	Stature.	Weight.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz.	ft. in.	lbs.	
18	50	8	44	11¾	..	..	..	..	..	..	Hydrops Ovarii.
60	36	8	36	6	1 4	2½	..	..	..	..	Apoplexy.
32	40	4½	36	6¾	2 11	..	..	..	..	..	Epilepsy; wasted. Ulceration of small intestines.
23	40	9	64	10	6 1	..	..	..	..	..	Peritom. Puerp. 10 days delivered; uterus 13½ oz.
24	31	6¾	42½	8½	3	..	..	..	..	..	Morb. Chron. Cerebri. Ulceration of colon.
20	40 2	8	55	10¾	5 4	2 4	4	..	5	68	Peritonitis Puerp.
67	49½	..	38 4	8 4	4	2	2 12	..	5 3	65	Apoplexy. Concentric thickening of left ventricle.
58	43½	6 8	47	7½	4¼	1 10	3 4	38½	5 2	70	Cancer Uteri. Some bronchial disease, &c.
25	40¾	8¼	56½	9	2 3	3 15	5	29	4 11	98	Influenza. Erysipelas.
40	41¾	10	64	12¾	9¾	..	..	48	5 4	117	Hysteritis.
26	40 11	7½	58½	9¾	5¾	2¾	4½	..	5 3	97	Pleuritis. Empyema.
32	45¾	6¾	53	8	3¾	..	4¼	..	5 2	106	Pleuritis. Empyema.
27	43	8½	60	13½*	15*	2¼	4½	46	5 5	90	Fever.
50	34	7½	34½	7½	3½	..	..	..	..		Hydrops. Diarrhœa.
60	39¾	8	41½	7¾	3 6	*7 10	..	..	..		Dyspnœa. Bronch. Chron.
25	..	10	50	..	4	2	..	..	..		Rubeola & Pneumonia.
58	..	7	29¼	4 13	1 14	1 16	..	..	..		Tumor Cerebri.
55	39	11	..	8 8	..	..	..	..	..		Carcinoma Peritonei.
27	44	11¼*	53¼	2¼	5 6	1¾	..	..	..		Uterine hæmorrhage.
45	50¾	9 11	42 11	5 9	3¼	1 14	..	..	5	77	Apoplexy.
24	39 9	9 14	61½	8	5 8	3 6	4 7	..	4 9	104	Influenza.
52	45	11¾	48	8¾	7¼	..	..	..	5 6	..	Poison. Very fat and muscular.
Totals.	1624	334	1882	325	162	69	74	..	..	..	
Averᵉˢ.	41½	7	46	8⅛	4¼	2⅓	4⅑	..	..	..	

Average of persons 89 lbs.

TABLE III.

MALES, from 60 years of age and upwards. All diseases except Morb. Chron. Cordis and Phthisis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
70	35	10½	38	8½	2	..	..	..	..	..	Atrophia Cerebri. Pneumonia.
73	42½	13	38¾	10½	5½	4½	..	..	..	..	Grey softening of right lung. Apoplexy.
70	45½	7½	30	6½	1½	..	..	..	..	..	Chronic diarrhœa and Anasarca.
84	35	11	57½	9½	3	1¾	..	..	..	..	Abscess of right lung. Fever.
14	50	8¼	32	9 6	4 10	3½	..	..	..	..	Extreme Emphysema Pulm. Hydrops. Right ventricle hypertrophous.
68	47	10½	46½	7½	2 10	3	..	..	..	..	Emphysema and Bronch. Chron. Coma and Delirium.
67	..	7½	30½	6	1 12	2	..	..	..	..	Bronch. Chron. Wasted.
..	48	9	..	11¼	4½	2½	..	..	..	..	Middle sized. Pericarditis c Delirio.
68	44	7 9	45	11 6	2½	..	..	..	..	..	Cachexia Scrofulosa. Kidneys much diseased.
78	42	11	32	8½	2½	..	..	..	..	..	Double hernia. Senectus.
65	..	12¼	32	6¾	..	..	..	..	..	..	Very fat. Mania with pleurisy.
87	38	11¾	31	7	4½	2½	..	..	..	..	Left ventricle hypertrophous. Aorta diseased.
69	49	12 14	51¼	14	5½	4	..	..	5 11	..	Bronch. Chron. Fleshy.
63	49 9	11 14	46½	9 3	3 13	1 6	4 9	140	5 3	..	Pneumonia. Bronchitis.
75	..	16¼	61	11½	4 2	3¼	..	122	5 7	..	Pneumonia. Pericarditis.
68	38	8¾	38¾	..	3 15	2¼	4½	75	4 6	..	Influenza. Valves and Aorta diseased.
63	44½	11¼	53½	10¼	2½	4	..	114	5 6	..	Pleuropneumonia.
83	47	10	69½	10	4¼	..	..	..	..	..	Cancer of Liver.
73	45	14½	51½	9½	3	..	..	..	..	..	Fever.
70	35	10½	38	8½	2	..	..	..	..	..	Convulsion and Coma.
73	42½	13	38¾	10½	5½	4½	..	..	..	..	Apoplexy.

TABLE III. CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
63	42	10 7	40¾	7½	5½	2¾	..	..	..	..	Ulceration of Bowels.
76	38	15½	46½	..	9 6	2¾	..	..	..	..	Cholera.
73	45	13½	48	10½	4 5	2 14	..	..	..	..	Fever.
84	45	11	57½	9½	3	1¾	..	..	..	..	Fever.
68	49	12	40	8	1½	1 14	..	..	..	..	Pleuropneumonia.
64	29	12½	17	8½	4½	..	..	..	..	..	Chronic Pleurisy.
78	42	11	32	8½	2½	2 3	..	..	..	..	Senectus.
63	50	15	58½	11	5½	1¾	..	..	..	..	Phlebitis.
65	..	10¼	32	6¾	..	..	..	..	..	..	Mania and Pleuritis.
87	38	11¾	31	7	4½	2¼	..	..	..	..	Senectus.
63	42	11 14	72¾	8 10	9 6	3 11	..	103	5 10	..	Suppurative Arachnitis.
63	44½	11¼	53½	10¼	2½	4	..	114	5 6	..	Pleuropneumonia.
63	49 9	11 14	46½	9 3	3 13	1 6	4 9	140	5 3	..	Pleuropneumonia.
66	..	11 4	68	11	5 14	3½	4 14	110	5 8	..	Influenza with Pneumonia.
68	45½	10 15	42½	6½	3½	1 14	5	88	5 3	51	Bronchitis Chron.
64	44¾	10¼	77	8	6½	1¾	6 10	95	5 7	44	Bronch. Chron.
Totals.	1437	438	1732	331	138	75	..	..	..	..	
Aver.	43½	11 9/11	45½	9	3¾	2¾	..	..	..	..	

TABLE IV.

FEMALES. Above 60 Years of Age. Various Diseases, exclusive of Phthisis and Morb. Chron. Cord.

Weight of 33 Hearts.	Number of Hearts weighed.	Total weight.	Average.
Under 7 ounces weight..	6	35¼ ounces	6 oz. nearly.
7 to 8 ounces	7	50½ ,,	7½ oz. nearly.
8 to 9 ounces	6	51¼ ,,	8½ oz. nearly.
9 to 10 ounces	5	47 oz. 9 dr.	9½ oz. nearly.
10 to 11 ounces	2	21 ounces	10½ oz.
11 ounces and upwards..	7	96 oz. 2 dr.	14 oz. nearly.

Average, for all the 33 cases, 9½ oz.; or, leaving out the 7 hearts above 11 oz., 205 oz. 13 dr. ÷ 26 = 8 oz. nearly.

TABLE V.

MALES. 21 to 60 Years of Age.—Phthisis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas	Weight.	Stature.	Stom.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz. dr.
32	49	10 12	53	8 12	4 12	2 12	90	5 5	5 4
37	46	8½	41½	9½	..	..	..	..	..
33	40½	10¼	66¾	10 10	10¼	3¼	..	..	..
35	47	10	71	10¾	7	3	..	..	..
56	42	8¾	51	..	7 6	2 3	..	..	..
56	45	8¾	55	7½	8	..	..	..	..
32	49	9¼	60	8¾	10¾	4	..	..	..
23	..	12	57	16	10½	4½	..	..	..
25	..	10¾	71	12	6	1 2	..	..	..
44	42	8	45	9	2	2¼	..	..	..
25	50¾	10¼	75½	16	13¼	2 6	..	..	..
31	46	8½	75½	3 14	11 6	2	..	..	..
44	42	13¼	53	9	8½	2¼	..	..	..
25	50¾	10¼	75¼	16	13¼	2 6	..	..	..
31	46	8½	75½	11 6	3 14	2	..	..	..
44	42	13¾	53	9	8¼	2¼	..	..	..
48	43	8	46	14	12	2 3	..	..	..
57	42	9½	..	9	..	..	..	..	..
43	51¾	6	48	8 14	4 10	2	..	..	..
30	47¾	9¼	47¼	9½	7½	3¼	102	5 4	..
33	47¼	10¾	65	12½	6½	3 10	100	5 6	..
32	49	10 12	53	8 12	4 12	2 12	90	5 5	5 4
50	50	8	52½	9	..	..	90	5 4	..
60	46 14	10	41½	9	5 8	3¾	91	5 8	7 2
30	49	11 3	72	13	5¾	2 3	..	..	..
36	43	10	68	6½	6	4½	..	..	..
59	47 5	11¼	49	9	6	2	102	5 6	..
Totals...	1155	266	1520	267	183	63	665		
Average.	46⅕	9⅛	58⅘	10¼	7½	3	94	nearly.	

TABLE VI.

FEMALES.—21 to 60 Years of Age.—Phthisis.

Age.	Brain.	Heart.	Liver.	Spleen.	Kidneys	Pancr.	Weight.	Stature.	Stomach
Years.	oz.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	lbs.	f. in.	oz.
53	47	11½	45	..	11⅜	..	..	..	..
24	39	5¾	47	9½	11¼	2½	..	..	..
60	46	8¼	41¼	5 6	8 10	..	..	..	..
53	40	7	34	..	7 2	..	..	..	..
44	40	9¼	45½	6	..	..	..	..	..
53	..	9¼	40	4⅜	4	1⅜	..	..	..
55	37	7½	53	3 14	8	1½	..	..	..
40	42	8½	54	2½	9¾	3½	..	..	..
21	45	7¼	39½	2 10	12	1 14	..	..	..
26	37	5¼	47½	11	8½	1½	..	..	..
46	43½	6 14	34½	..	6¾	2	..	..	..
43	45	9	51	10½	13¼	3	69	5 3	4
47	..	10	38½	6	9	1½	..	..	..
60	37	5 6	30	2½	6 13	1	..	..	..
25	46¾	8¼	48	4¼	12½	3 15	75	5 3	6
49	43¾	6 5	35½	2½	5 4	1	55	5 3	5
Totals ..	589	125	684	71	134	25	199	..	15
Averages	42⅗ nearly.	8 nearly.	42¾	5½	9 nearly.	2 1/15	66	..	5

TABLE VII.

MALES, 21 to 60 years of age.——Morb. Chron. Cordis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases.—Remarks.
Years.	oz. dr.	oz. dr.	oz.	oz.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
47	44¾	12¼	59⅓	10¼	4 15	2 12	5 12	105	5 9	..	Pleuropneumonia and Pericarditis.
54	44½	17½	51	8	5¾	2	4¼	88	5 4	..	Influenza.
57	42	14½	68	10½	7¾	4	7	120	5 8	..	Pericarditis.
45	51	15 4	54	9½	4 15	2 15	5	150	6	..	Morb. Chron. Cerebri.
20	51	13½	49¾	10¾	2 8	3 4	4 15	90	5 2	..	
45	49	11 4	105¾	30½	4 6	4 8	6¼	135	5 10	..	Hydrops.
51	46 12	12 6	58½	13½	7½	2 14	5 7	101	5 7	93¾	
56	42	19¼	43¾	9	3 13	2½	4¾	110	..	59½	
57	53¼	16	49	5¼	2	3	5 7	118	5 10	39¾	
51	50	10⅜	52¾	8¾	3¼	3	5¾	101	5 6	60	Apoplexy. Pericarditis.
48	53¼	24	39	12½	3½	3¼	4¼	109	5 6	60½	
37	44½	14½	86	13½	22½	5	5	117	5 7	79	
54	49¼	9 13	49	9½	5¾	2¼	5	100	5 7	90¾	Mitrals diseased.
34	45¾	24½	60¼	11½	9¾	2 14	6 10	123	5 8	44	
30	52½	20	57¾	12½	5	3	5	102	5 5	59½	
32	48½	12	72	..	10½	..	..	..	..	..	Fleshy. Middle size.
46	51	immense.	55	15½	3¼	2¾	..	..	..	..	Spare. Tall.
59	50½	12¼	53	8½	4¼	..	..	..	5 10	..	
59	51	17	36	12¾	6½	2¾	..	..	..	..	
33	51	26	72	12½	8 6	4 6	..	..	..	..	Tall.
54	43½	14	62¼	11¾	3	..	..	..	..	..	Mania and Typhus. Tall.
56	37¾	12½	55	10	5½	4	..	..	..	..	Typhomania. Tall.
60	50	15	36½	..	1	2½	..	..	..	..	Negro.

TABLE VII.—CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases.—Remarks.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
60	51	10¼	48	9	2¾	2 14	..	..	..	..	
33	53	40¼*	95½	16¼	10½	3 10	..	..	6 3	..	*Aneurism of Aorta. Heart and Pericardium coherent with sac.
51	..	17	50	14	7	5	..	..	..	..	Lungs and Aorta diseased.
55	53½	13	67½	12¼	large.	3½	5½	119	5 3	65¾	
38	..	20	52¾	8½	16	3½	..	..	..	..	Emphysema Pulm., &c.
42	..	15¼	81	15½	5½	3½	..	..	..	..	Pneumonia. Hydatids in the heart.
21	47	11¾	51¼	9	4	3 3	..	..	..	..	Gangrene Pulm., &c.
33	51	26	72	12½	8 6	4 6	..	..	..	..	Bronch. Chron.
47	47 4	14 4	72	11½	12¼	3 12	4	117	5 3	...	Influenza.
59	53	22 15	62½	18 11	9	4½	..	...	..	..	Large person.
60	53	13¾	53	8	3¼	..	..	..	..	..	Good size.
39	43	17¾	64	8½ (rt.k.)	7 6	2 3	..	..	..	..	Pulm. Apoplexy. Left kidney atrophied.
36	48	12	50½	9	6 7	3½	..	..	..	..	Pneumonia.
30	..	18½	73¾	12½	16½	2¾	..	..	..	..	Pneumonia & Morb. Cord.
26	47	19	74¼	12 10	13¼	2	..	..	..	..	Morb. Cord.
30	42	11½	73	13½	8¼	..	..	..	5 7	..	Aneurism.
27	50½	17½	77	11¾	7½	..	..	173	5 8	..	Pericarditis and Pleuritis.
35	52 11	11 6	60	11½	3½	1 15	..	106	5 ,2	..	Pneumonia and Pericarditis.
Totals.	1795	616	2503	452	354	113	90				
Averᵉˢ.	48½	15¾	61 nearly.	12 nearly.	9 nearly.	3¼ nearly.	5¾ nearly.				

TABLE VIII.

Females, 21 to 60 years of age.—Morb. Chron. Cordis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Person.—Disease.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
45	35 9	14 8	42	7 8	4	1 14	5 10	74	..	..	
23	44	15½	55	10½	..	..	..	..	..	..	Foramen Ovale open ; fleshy ; middle.
31	41	enlarged.	enlarged.	12	7	..	..	..	..	...	Communication between Pericard.
28	48½	11	64	11½	4	3	..	..	..	..	A week confined. [and liver.
52	..	11¼	60	7¼	4 15	3 2	5¼	133	5 4	..	
60	39¾	8	41½	7¾	3 6	2 10	..	..	..	..	Fleshy. Bronch. Chron.
54	42	12¼	36½	6	5 15	2 2	5¼	115	5 1	30½	Hydrops.
50	42½	17½	49½	10½	7	3	..	..	..	..	
60	40	11	50	9	3	3 2	..	..	..	..	Pneumonia.
57	..	15	44½	8½	4½	2	..	..	..	..	Pericarditis and Bronch. Chron.
50	45 12	14 12	62	12 8	9 4	1 14	6 4	200	5 6	..	Sudden apoplectic death.
33	48	15¼	56	11½	5½	2 6	..	..	..	..	Emphysema. Morb. Valv.
30	43 14	12	47½	8¼	7½	2⅝	6¼	90	5 2	42½	Hydrops.
59	43	11½	45	8½	8	2 14	..	..	..	..	Sudden death.
43	44	11	50½	8¼	9¼	3 7	..	..	..	..	Pneumonia duplex.
37	52	11¾	55	10 6	5 2	3 6	..	..	5 2	..	
54	57½	13	34¾	9 9	1 10	4 2	..	99	4 9	..	Curved spine.
52	39 6	12¾	45	8¾	3 2	2 5	..	102	5	..	Admitted moribund.
52	43	14¼	35½	7 5	3 15	2	4	83	5	..	Influenza and Pericarditis.
34	44 4	13¼	71½	14	5 15	4	5½	99	5 3	..	Influenza.
Totals.	794	245	946	189	108	49	38	..	..	73	
Aver^{s}.	44½	13 nearly.	49¾	9½ nearly.	5⅔ nearly.	2⅔ nearly.	5½ nearly.	97lbs.	..	36½	

REMARKS

ON

MALIGNANT DISEASES

OF

THE SKIN OF THE FACE.

BY CÆSAR HAWKINS,

SURGEON TO ST. GEORGE'S HOSPITAL.

READ MAY 9TH, 1837.

THE chief object of the following remarks is to describe a peculiar form of malignant disease of the face, which does not appear to have received any distinct notice by surgical writers, although its character is so well marked, as to require a separate consideration. To make myself understood, however, I must, in the first instance, endeavour to describe briefly the more familiar forms of malignant disease, in order to compare the several varieties with each other.

But as the term *malignant* is employed in a very vague and ill defined manner, it is necessary to premise, that it is my intention, in these observations, to restrict it to such diseases, as essentially possess a new structure, capable of exciting a poisonous influence in one or more of these several modes; 1st, upon the *neighbouring textures*, which are converted into a substance, either exactly similar, or at least analogous, to that of the new formation; 2dly, upon

the *absorbent system*, so that the nearest glands become enlarged into a tumour like that originally deposited; or 3dly, upon the *whole constitution*, so that the poisonous secretions of the newly formed part gain access to the circulating fluids, and tubercles of various forms, but of the same or analogous character, become developed in some distant organs or textures, which have no direct communication, except through the blood, with the parts in which the new structure was first formed.

This poisonous influence is equally shewn in its several degrees, whether the malignant structure be supposed to be entirely local in the first instance, or to be preceded invariably by a peculiar predisposing condition of the whole system; since, even on the latter hypothesis, the secretions of the local tumour still further contaminate the blood, as soon as absorption begins to take place.

By this restriction of the term, we exclude from among the malignant diseases of the face, 1st, the irritable and intractable ulcers of this part, so well described by Mr. Earle, in the 12th Volume of the Transactions of the Society; 2dly, the various forms of Scrofulous Phagedenic Ulcer, or Scrofulous Lupus, which attack the nose, eyelids and cheeks; 3dly, the several varieties of Tubercular Sebaceous disease, Tubercular Lupus, Cancer perforans, Noli me tangere, or whatever other name is adopted to designate these destructive ulcerations, which occur in the same parts; and, 4thly, the Hypertrophy of the Skin of

the nose, described by Mr. Hey, Civadier, and other writers, and often called Cancerous Tumours, Loupes, Lipoma, and so on, though they have nothing in common with those affections. None of these are malignant in this confined sense, however large may be the tumours of the last named disease, or however extensive and destructive the ulcerations of the three preceding, because the interior of the tumours, and the hard edges, and fungous granulations of the ulcers, contain no new structure, but are a development of the natural textures, with the deposits of inflammation only, incapable of affecting other parts of the body, even when fatal to the lives of the wretched objects, who are victims to these frightful disorders.

I. The class of fungoid malignant diseases, whether in their *hæmatoid, medullary,* or *melanoid* varieties, require little notice, since they seldom occur in the skin of the face, except when the constitutional taint has already evinced itself by the formation of a tumour in some other part of the body. The forms most frequently developed in such cases are the melanotic tubercles, or a soft lardaceous kind of medullary tumour; these are seldom single, like the several forms of cancer, but are in great numbers over the face and scalp, and are too rapidly formed, towards the end of the patient's life, when he has nearly sunk under the same disease in some other part, to occasion trouble in determining their nature. For the same reason, there is seldom time for the processes of softening and ulceration, and fungoid growths; but

if these phenomena do take place, they present nothing striking to our observation, beyond what is usually to be seen in this disorder elsewhere.

II. The class of scirrhous, or cancerous complaints, on the contrary, are very peculiar when met with in the face, and differ in many respects from what is usually called cancer, whence has arisen much difference of opinion as to their nature, and whence, consequently, have taken place some errors of practice, injurious to the reputation of the surgeon, and to the well being of the patient.

Cancer of the skin of the face is presented to our notice in three different forms, of which the most frequent may be called,

1. The *common cancer of the face*, with which, as it shews itself in the lower lip, most surgeons are familiar.

It commences for the most part in the form of a little hard tubercle in the substance of the cutis and subjacent cellular texture, with the little ulcer or fissure which takes place in it, covered from time to time with a thin scab. A tumour of this kind I removed from the lip of a woman 45 years of age, several years ago, since which time I have had the opportunity of knowing that no return of the disease has taken place.

To this stage succeeds a deep excavated ulcer, with a foul and painful surface,—or a mass of exuberant granulations, flabby and bleeding slightly. The original tubercle now no longer exists, or is mixed with hardened cellular substance in the neigh-

bouring textures, and some minute scirrhous tubercles are sometimes visible in the muscles around the ulcer. Next perhaps succeeds a further stage, the ulceration having spread extensively on the inside of both lips, and having affected the gums and lower jaw, part of this bone being softened and ulcerated, and part exfoliating slightly.

The unfortunate patient is generally carried off by the disease in this stage of contamination, worn out by the irritation of the foul, fœtid, bleeding and sloughing ulcers of the face and glands, or half starved or suffocated from their pressure, the tumour forming sometimes a great mass of cancerous disease, from the jaw to the sternum, with deep excavated ulcers of several inches' diameter. In a few cases, however, the poison is absorbed, and the whole system contaminated, so that tubercles of scirrhus or fungus hæmatodes are found in other parts of the body. It is enough to refer to one such case: a patient who died in St. Bartholomew's Hospital in 1833, with cancer of the lip, in whom a few scirrhous tubercles were discovered in the liver, and an immense number in every part of the heart*.

When *common cancer* occurs in other parts of the face, it presents exactly the same characters: viz., the excavated ulcer, with its hard everted margins and fungous growth, together with the peculiar sallowness of the countenance so expressive of malignant disease.

* Med. Gazette, Vol. XIII. p. 575.

The experience of every surgeon demonstrates, that although the tumour, or the ulcer which succeeds it, may often be removed with success, yet that a return is frequently to be expected, much more frequently, for instance, than in the cancer scroti; and further, that no measure can safely be trusted, except complete excision, sometimes by the hare-lip operation, at other times by the removal of a semilunar portion of the edge of the lip, according to the situation, shape and size of the disease, or occasionally by the Taliacotian method;—and in the rest of the face, by some kind of operation, adapted to the form and local circumstances of the part affected.

2. The second form of cancer of the face is one which I have been accustomed for some years to describe under the name of the "cancerous ulcer," or "phagedenic ulcer of the face of old persons."—Its usual origin, I believe to be a flat brownish tubercle, generally situated in the angle between the cheek and the ala nasi, or in the inner canthus of the eye, which is frequently stationary for a long time before some accidental violence induces ulceration;—this tubercle is softer, flatter and darker than that of common cancer, as if it implicated the outer texture only of the cutis, including the coloured rete mucosum.

The ulcer has a dark shining appearance, with slight elevation of its edges, which are jagged and irregular, and the skin around is not thickened nor inflamed, as in ordinary cancer, from the ulcer of which it is also distinguished by the trifling pain which accompanies it,—by the absence of hæmor-

rhage, sloughing and fungus, and by its very slow progress,—many years sometimes elapsing before very extensive ravages have been committed by it, during which time the ulcer sometimes remains nearly stationary for a time, or becomes covered by a thin skin, in which the vessels of the subjacent texture are visible; and in these intervals of rest the new structure at the edges diminishes in thickness.

In a case of this kind a little wart (as it was called by the patient) had been ulcerated four years, at the margin of the nose, and yet had not become half an inch broad, and was only just beginning to ulcerate into the nostril. It was my intention to have cut out the diseased parts, and to have brought round a portion of the skin of the face to supply their place, when a severe and nearly fatal attack of erysipelas effected a cicatrisation of the ulcer for some time, and successive attacks of the same disease, with domestic circumstances, prevented the operation being performed before I lost sight of her, a few months ago*.

While the ulcer spreads gradually, opening into the cheek, or the malar and maxillary bones, or leaves the eyeball suspended in its socket, with destruction of the eyelids and circumference of the orbit, and partial exfoliation and softening of the bones with which the disease is connected, its difference from ordinary cancer is evinced in the most remarkable manner, by the little disturbance which it causes in

* I have seen this patient several months since this paper was read, and the ulcer had made very little more progre

the general health, and by the entire absence of contamination, as far as I am aware, in the absorbent glands. It possesses the same degree of power of contaminating the surrounding textures as is seen in the warty or cancerous tumours of cicatrices, which I have endeavoured to describe in the 19th volume of the Transactions, but is perhaps only malignant in this lowest degree, and is, therefore, if it does not affect the glands at all, an instance of purely *local cancer*, which the common cancer of the face, and the cancer scroti are often called, but very erroneously, since they affect both the glands and the general system. At all events, if it ever affect the glands, such an occurrence is very rare, and I have not seen it where the ulcer has existed a great many years, and has destroyed the patient by its local effects.

The slow progress and peculiar appearance of the ulcer have sometimes led to the disease being called *lupus*, or *lupoid tubercle*,—but I prefer the designation I have before given it of *cancerous ulcer*, as indicating the scirrhous nature of a new structure, possessing a malignant influence upon every texture in its neighbourhood,—yet inferior to common cancer in the degree of malignancy, since it does not contaminate the absorbent glands,—it is, in fact, what is sometimes called semi-malignant.

I met not long since with an excellent account of the ulcer of this disease, by Dr. Jacob, in the 4th volume of the Dublin Hospital Reports, under the title of an "Ulcer of a Peculiar Character, which attacks the eyelids and other parts of the face," but

this gentleman does not seem to be aware that the origin of the disease is usually tubercular, although its malignant influence may be generally observed during its whole progress,—some new structure at the margin, or a little thin layer of a brownish white colour below the ulcer, shewing the real character of the disease.

When the ulcer spreads from the eyelid to the conjunctiva of the globe of the eye, the cancerous deposit can even then be dissected and exposed, the existence of any portion of which, after an operation, will cause the reappearance of the disease. On the other hand, the cancerous ulcer is very often confounded in description with ordinary cancer; for example, in the excellent observations on Malignant Diseases, by Mr. Travers, in the fifteenth volume of the Transactions, in addition to a graphic account of, "Cancer of the Lip," and in another section, of "Cancer of the Eyelids and contents of the Orbit," both of which are of the ordinary form of cancer, there is a third section, on "Cancer of the Face," which appears to me to include partly the "cancerous ulcer," and partly the characters of ordinary cancer: the smooth, shining surface, and slow progress of the one, with the fetid discharge, exuberant fungous granulations, and frequent hæmorrhage of the other. The best account of the whole disease, however, with which I am acquainted, is by Mr. Mackenzie, in his admirable work on the Diseases of the Eye, but under the name, without any qualification, of "Cancer of the Eyelids."

While, however, I prefer the modified term which I have long employed of "Phagedenic or Cancerous ulcer," to designate the lower degree of malignancy of this form, in comparison with that of ordinary cancer of the face, it must be remembered that it is very difficult to destroy all the new structure of even this local disease by caustics, and also, that wherever vain and injudicious measures are adopted to *heal*, what in fact must be *removed*, the disease may be much aggravated, and made more like ordinary cancer in its progress. On the whole, it appears to me that the removal, by the knife, of the tumour or of the ulcer, is in general the safest method, but in a broad flat ulcer, without any depth of new structure, I prefer the employment of the chloride of zinc, as lately introduced into practice in this country by Mr. Ure, after witnessing its use by Dr. Cangurin, which I have frequently had recourse to without any of the injurious effects of other caustics.

3. The third form of malignant disease of the scirrhous kind in the skin of the face, may be called the *Cancerous Tumour* or *Fungous Cancer of the Face of old persons*, of which I am not aware that any account has been written.

The early stage of this disease is presented to us in the appearance of a small round or oval tumour in the skin, generally in the cheek, or over the malar bone, or on the ala nasi. It is nearly of the natural colour of the skin for a long while, or is a little whiter, from the outer part of the cutis being thinned by the growth of the tumour, so as to allow the

colour of its interior to shine through it. A section of the tumour shews it to be white, solid, but not very firm, lardaceous in consistence, rather than of the firm hardness of ordinary cancer. It has a well defined margin, separate from the rest of the skin, and where it projects below the cutis it is covered by a kind of cyst.

The tumour is more globular, soft, insulated and distinct, more completely confined to the texture of the skin, more elevated and less liable to become puckered, than ordinary cancer of the skin of the face, and less liable to have lancinating pain before the ulcerative stage has begun.

It is more elevated and circular, and of a whiter colour, more abrupt at its margin, and extends deeper into the substance of the cutis than the tubercle of the *cancerous ulcer*.

It has fewer vessels ramifying on its surface, and has none of the livid colour, previous to its ulceration, of fungus hæmatodes, nor of the darkness of structure of melanosis, and its texture is firmer and more organized than that of medullary tumours. It is distinguished too from all these diseases, by its being single, and by the length of time that it remains stationary.

If it forms upon the nose, it is easily distinguished from the tumours of hypertrophy of the ala nasi, by the absence of surrounding redness and thickening, by its defined cyst-like limits, and by its having none of the enlarged sebaceous follicles observed in that disease.

The tumour grows thus smooth, globular, and nearly unattended with pain, to the size of a nut, or of a walnut, before it excites apprehension in the patient's mind. At last it is pricked or irritated, or ulcerates spontaneously, and there arises a mass of healthy granulations from the surface, which spread out considerably beyond the tumour, over the surrounding skin, to the height of an inch or more, with a copious discharge of healthy pus, without fœtor, and without sloughing or bleeding, and not even now very painful. The tumour at the basis of these granulations increases in depth and in diameter, but is free for a long time from any attachment by altered cellular texture to the subjacent parts, so as still to allow of removal with every chance of success. This stage is seen in drawings* 4 and 5, and in the preparations of the ulcerated tumours subsequently removed from the same patient, which, however, it may be observed, (like all vascular tumours) are not half so large as they were before their removal. The disease returned in one of these cases (for reasons which will hereafter be mentioned); in the larger of the two the disease had not returned for two or three years after the operation, when I saw the patient last.

A comparison of these drawings with the former shews how different the circular prominent fungus of this disease appears from the soft irregularly formed granulations, and the excavated ulcer with everted

* These and other drawings, together with preparations and casts illustrative of the descriptions in the paper, were exhibited.—Ed.

margins of the *common cancer;* and from the flat, dark coloured surface, destitute of granulations of the *phagedenic ulcer;* neither has it any resemblance to the bleeding, sloughing surface of *fungus hæmatodes.*

The tumour grows to a considerable size before it alters its character, and before the general health suffers much, as will be evident by an examination of a cast on the Table, in which the prominent mass occupies the whole side of the nose, and formed an ulcerated tumour, three inches in diameter, and nearly two in thickness. The appearance of the surface was here a little altered before the cast was taken, and its prominence lessened by the application of a solution of arsenic, with some diminution of the pain the patient experienced from the disease, which had commenced fourteen months previously; part of the tumour had been then removed by a ligature by a very distinguished surgeon, no doubt from his not being aware of its true nature. The form of *cancerous tumour* in this patient, although of so large a size, is well contrasted with *common cancer* of the same part, in the two casts; both patients died about four months after they were taken, and yet the subject of the former had none of the peculiar leaden hue in the countenance illustrative of the more malignant variety in the latter case.

After a time ulceration extends more deeply into the tumour, and its projecting appearance is lost; the bones and deeper parts become rapidly changed into the new structure, which, in some parts, is gristly

like scirrhus, but in others is softer and more pulpy, like some cases of medullary disease of the bones. The ulcer in this stage is also somewhat intermediate in character between these two diseases.

R. B., æt. 59, was admitted into St. George's Hospital in April 1835, the disease having commenced about twelve months previously by a small lump on the bridge of the nose, which ulcerated in six months, when of the size of a sixpence, attended subsequently with a good deal of pain. There was on his admission a rather foul ulcer an inch in diameter, on the surface of a fungous mass, which I was induced to believe, from its appearance, was an instance of this peculiar *fungous cancer*. The tumour reached transversely from one maxillary bone to the other, and from the frontal spine nearly to the tip of the nose,—part of the fungous granulations projecting into the nostril, and the nasal bones having been converted into a soft mass with some loose spiculæ of bone. I at first thought of attempting the removal of the tumour, and bringing down some of the skin of the forehead to form a new nose, but it soon became evident that the disease had begun to affect the frontal bone, and was attached firmly to the maxillary bones at the side of the nose; —the poor man was also weak and thin, and had been totally blind from amaurosis for some years, and seemed therefore unfit for such an operation. The tumour gradually spread laterally, and ulcerated more extensively, and in November following presented the appearance exhibited in the drawing. He

died in February 1836, about two years after the disease commenced.

The brain was healthy, with the exception of a small quantity of water. The optic nerves passed close to the disease, the bone through which they passed just beginning to be affected by the disease; they were considerably flattened, and darker coloured than natural, but had their healthy rotundity and appearance near the eyes. The amaurosis being long antecedent to the appearance of the tumour of the skin, had of course no connexion with it. The parts affected by the disease can be seen in a preparation. The frontal bone was just beginning to be softened and rough by the disease where the nasal bones had originally joined it, all trace of which was lost. The dura mater lining the interior of the æthmoid bone, and part of the sphænoid, and of the frontal around the æthmoid, shewed a few small projections of the disease into the cranial cavity; a great part of these bones, together with the nasal parts of the maxillary and palatine bones, having been converted into a whitish tumour, in consistence between scirrhus and fungus medullaris, all the cells of the nose being filled with a similar substance; where subjected to more pressure however, and therefore probably growing less rapidly, it resembled scirrhus. The antrum on each side was clear and healthy. The soft palate, in contact with the palatine plates of the palate and maxillary bones, was thick and hard, as if scirrhous. The sphænoid cell contained a little thick pus, and a part of the bone was dead, and

partly loose. The olfactory nerves going through the tumour preserved their natural appearance. The liver was granulated, but all the other viscera were healthy, and no gland appeared to have been contaminated.

The patient from whom the fourth drawing was taken was a man, aged 79, who was admitted into St. George's Hospital in July 1833, with the small tumour on the cheek there represented, which had begun eight months before, and had been ulcerated three months. The tumour was removed, but a small tumour reappeared under the cicatrix, no doubt from a very fine portion of the tumour, which I discovered running perpendicularly towards the malar bone, by the side of the chief part of the tumour, which had been cut across and unfortunately escaped observation. I wished to have again removed the tumour, with the malar bone, to which it was attached, but he would not submit to it. In January following, an ulcer formed in the new tumour, with much pain, and a small gland was felt hardened under the chin, and two others at the margin of the sterno mastoid muscle. He continued to linger till November 1834, about two years from the beginning of the disease.

Before his death the tumour extended considerably over the temple, and over the upper and lower jaws, and nearly to the nose, there being in the centre a large deep ulcer, the malar and maxillary bones having been destroyed, so that the probe passed down to the bottom of the orbit, full four inches

deep, and might, in fact, have been made to enter the brain. The surface of the ulcer to the last, was generally healthy, red, and granulating, and nearly free from bleeding and from sanious or fætid discharge, though it had much of the severe lancinating pain of scirrhus.

The dissection was very interesting. One preparation shows the size of the ulcer, and the scirrhous nature of the tumour, which remained at the time of his death, a section having been made of one portion, which is turned back for this purpose;—it shows also the formation of this new substance over the surface of the eyeball and its muscles, where they have been left insulated by the ulceration, the tendon of the temporal muscle, and the coronoid process of the lower jaw having been also connected with the same structure.—The malar bone, the zygomatic process, and the front of the antrum were destroyed, its membrane being unaltered, and the duct of the parotid gland was destroyed, the flow of saliva from it having been very distressing to the patient during his life. The same preparation shows also the manner in which the temporal parts of the sphænoid and temporal bones were concocted into new substance, softened and ulcerated by two openings, one of them half an inch in diameter, which led into the interior of the cranium;—to these openings the brain adhered, the dura mater having also ulcerated; and the hemisphere of the cerebrum, which was much flattened when first exposed, presented a large cavity capable of containing several ounces of fluid, extend-

ing through the whole length of the middle and posterior lobes of the cerebrum. This cavity contained no pus, which had doubtless escaped through the opening at the bottom of the orbit, but the interior was vascular, and the brain was darker and yellowish, as round an apoplectic effusion. It was remarkable that, notwithstanding this extensive disease, the mind of the patient had not been in the least affected during his life.

Two or three glands were enlarged and hardened; —one had within it some cheesy matter, and another some green pus, the structure of the substance of the glands being probably scirrhous, though not very distinctly so.

One kidney contained an aqueous encysted tumour in its substance, the size of a nut, and had another, holding six or eight ounces of water, attached to its outside, and making the surface of the organ concave from its pressure. These cysts were of the nature of those described by me in the 18th volume of the Transactions, and are of course not to be considered as any evidence of malignant disease. In the lower part of the liver, however, was a circumscribed circular tumour, about four inches in diameter, of a dark colour, solid and vascular, and with some marks of effused blood in its substance; it seemed to be a deposit of new substance in the texture of the liver, without defined limits, and though it does not exactly resemble the usual forms of fungus hæmatodes in the liver, yet it can hardly be examined without being supposed to be a ma-

lignant tumour, more like that form of disease than any other with which I am acquainted.

It appears to me then that when the cancerous tumour of the face has reached its third stage of advanced ulceration, it bears more resemblance than it previously does to common cancer of the lips and face; but it is attended with more tumefaction around and beneath the ulcer,—the edges are less curled and hardened,—the discharge is healthy purulent secretion, instead of offensive watery and sanious fluid of a peculiar odour;—and there is much less disposition to bleeding and sloughing.

It is easily distinguished from the Phagedenic ulcer of the largest size by its tumefaction and fungous growth, by its granulating and vascular surface, by the depth and extent to which the subjacent parts are excavated and converted into new structure, by the greater pain which accompanies it, and by the rapidity of its progress:—its final and fatal stage being attained in about two years, instead of, perhaps, twenty or thirty.

The fungous growth, where not subjected to pressure, and growing therefore more rapidly, as in the cells of the nose, is much like what takes place in some cases of fungus hæmatodes or medullary tumour, but for the most part it is of a scirrhous character, and may be considered, perhaps, like many tumours, to be in a manner intermediate between or to partake of the nature of the two classes of cases. The ulceration, however, differs from that of fungus hæmatodes, as much as it does from that of common

cancer, in having none of that rapid sloughing and bleeding, characteristic of tumours of that description.

In malignancy it is intermediate between the cancerous ulcer and the common cancer;—more rapidly and extensively contaminating the surrounding parts than the former, but not having the neighbouring scirrhous tubercles, and scirrhous bands of cellular texture, met with in the latter disease, and admitting, therefore, of removal by the knife, if sufficient care be taken to excise the whole, with more chance of the cicatrix remaining sound, than in ordinary cancer, —in fact, with almost a certainty of success, where it has not attained a great magnitude.

With regard to the absorbent system, the last case would seem to show that the cancerous tumour does affect it, which is never the case, as far as I know, in the cancerous ulcer of the face;—yet the enlargement of the glands is, at all events, very rare, and we need entertain very little fear of a return of the disease in the glands, after removal of the tumour. In common cancer, on the other hand, the contamination of the glands is very common, and frequently destroys the patient after the operation, even when the cicatrix has remained sound.

Finally, it would seem, from the tumour of the liver in the last case, that the whole constitution may be impregnated with the poison of this complaint, in which respect also the cancerous tumour is more malignant than the phagedenic ulcer, in which I do not know that such an occurrence has ever been ob-

served. But in this point too it is probably surpassed by the common cancer of the face, in which form of disease scirrhous tubercles of the liver or some other organ, (it has already been remarked,) have occasionally been observed; although even in this, the most malignant form of cancerous disease of the face, the simultaneous development of the poison in other organs or textures is rare, in comparison with cases of cancer or fungus hæmatodes of most other parts of the body. Therefore, if the tumour of the fungous cancer is carefully removed by the knife, and not trifled with by caustics, and no gland is enlarged at the time of removal, the prospect of cancer becoming developed in some other part of the body, though not impossible, is too remote to excite any apprehension of a failure of the operation from this cause.

P.S. Some months after this paper was read to the Society, a work on Tumours was published by an American author, Dr. Warren, which contains a description of the cancerous ulcer, in many respects correct, under the name of *Lepoides*, from the bark-like scaly crust formed on the surface of the little brown tumour, before it has been excited into ulceration. As however the crust from which the name is derived, is only an occasional circumstance, not often found, it does not appear to me to be a good term by which to designate the disease, especially if I am correct in believing it to be a variety of cutaneous

cancer. I am glad to find, however, that this gentleman, like myself, is of opinion that the malignancy of the ulcer is confined to its immediate neighbourhood.

31, Half-Moon Street,
May 2, 1837.

ON A PECULIAR SYMPTOM

OCCURRING IN SOME CASES

OF

ENLARGED LIVER.

BY JOHN G. MALCOLMSON, Esq.,

SURGEON IN THE MADRAS ESTABLISHMENT.

COMMUNICATED BY THE PRESIDENT.

READ MAY 9TH, 1837.

Previous to the year 1832, one or two cases of abdominal disease had occurred to me, in which a remarkable symptom was observed in the chest, which differed from any described by Laennec and other writers on auscultation. It was a loud sound, (as heard through the stethoscope,) between a crepitous rattle and a bleating, audible to the patient and even to the bystander, and accompanied by a vibration of the parietes of the thorax, communicated to the hand applied to the part. I was unable to ascertain the cause of the symptom, until the following case occurred to me, while attending the Hospital of H. M.'s 46th Regiment, at Hyderabad, during the illness of my friend Dr. Gualter. As the case has important bearings on several questions relative to disease of the liver, on which the opinions of the profession are at variance, it may be proper

to enter somewhat more into detail than would be necessary for the illustration of the particular object of this paper.

The following details are extracted from the Hospital Journal.

CASE.

L. M'Donald, æt. 29, was attacked with violent symptoms of hepatitis during the latter part of 1832, for which he was twice bled to the extent of 30 and 40 ounces, and had 90 leeches applied, during the first two days. He took 10 grains of calomel, with the same quantity of Dover's powder, at bed time; and three grains of the former medicine during the day. These measures and a blister relieved the symptoms, and the gums became tender; but some evening excitement continued. Pain in the epigastrium now came on, and was relieved by bleeding to 16 ounces, the application of 20 leeches, and fomentations. On the morning of the 20th December, he complained only of weakness; but in the course of that day, he was seized with severe pain in the left lobe of the liver, on pressure and full inspiration. The pulse was 85 and weak. Sixteen leeches and a blister relieved him, but next day his legs were œdematous and medicine was omitted. He had now night fever, (never the same on any two nights,) cold sweating, feeble but not quick pulse; and the stools were feculent, liquid, passed easily, and most frequent at night. The report of the 1st January notices external tumefaction, occupying the right

hypochondrium and extending towards the umbilicus and into the left side. The stools were white, and mixed with a little mucus: P. 94; and he slept pretty well. On the 11th, the swelling is reported as on the increase, and that evening the patient passed, with relief, what he compared to boiled sago mixed with blood. The evacuations were of a deep yellow colour; next day they were white and mixed with mucus, the swelling had somewhat diminished, and there was much dejection and great complaint of debility. During the rest of January he continued to pass frequent stools, sometimes containing bloody mucus and pus of a putrid smell, at others thin, light coloured, and feculent; and suffered occasionally from acute pain in the tumefaction, and from tenesmus and pain in the hypogastrium. The œdema and emaciation increased, the pulse got more feeble, and there was a greater appearance of sinking, although the countenance was occasionally flushed. Sleep was procured, and the purging checked, by opiates.

On the 1st February the pulse was 78, irregular and sharp, and the skin was hot. On the 3d, the pulse was firmer, and he complained of acute pain of the right shoulder and scapula, and in the tumour. The bowels were more regular. He was immediately relieved by the application of 12 leeches and a blister.

On the 8th he appeared much better, notwithstanding the pain in the shoulder being again severe.

On the 14th I took charge of the patient, and shall give the remainder of the case as recorded in my notes at the time. The pain of the side extended to the shoulder, but was principally felt round the tumour, a little above and to the right of the umbilicus, where the parts were harder than in the tumefaction itself, in which some elasticity was perceptible. It is prevented coming forward by the great thickness of the rectus muscle. He could only lie on the right side, and the pain of the shoulder was distressing on turning in bed. The breathing was a little quickened, and the sound or percussion, below the 5th rib on the right side, was quite dull. The patient asked for blisters, from finding them give him much relief. I omitted small doses of calomel he had been taking, and gave him anodynes at bed time, which procured him good rest.

20th February.—Fluctuation is now evident, and the skin over the tumefaction is œdematous; it has been exceedingly tender for some days, especially at the right edge of the rectus; and pressure causes pain to shoot towards the hypochondrium, and to the lumbar region, where there is pain separate yet connected with this. He cannot extend the trunk, and is confined to lying on the right side, with the thighs and body bent forward. Sweats at night, but his countenance is better, from sleep obtained by the draughts. Skin sallow. No purging. Tongue white, not furrowed, or highly furred. Some fluid in abdomen. The lower part of the chest is con-

siderably distended, and he says, that he formerly had great swelling of the left side, in the region of the spleen. Left hand is much swollen. Poultices relieve the tightness.

From this time till the 9th of March he became more and more distressed, although his eye was clear, and he did not sink. Bowels are occasionally loose, and he passes a white fluid, which, on the slightest motion of the vessel, separates into flakes; it has every appearance of pus. The face is puffy, and he can only rest lying on the right side or sitting up in bed. The tumour shows a tendency to point at its upper part, but makes no progress.

March 10th.—Is suddenly seized with acute pain over a small space of the anterior part of the left side of the chest, between the sixth and seventh ribs. There is a very distinct, sharp vibration communicated to the hand applied to the spot, with an emphysematous feel between the ribs *, but attended with a loud crepitous bleating, distinctly heard without the stethoscope. Some mucous rattle in the throat, and he expectorates a little thick adhesive mucus. The respiration is hurried, he is exceedingly anxious, and is forced to sit up in bed. Pulse very quick and weak. Apex of the heart seems to be thrust up a little higher than usual.

17th.—He was a good deal relieved by fomenta-

* The emphysematous feel was also to be perceived, in a slight degree, over the tumour, but not in the intermediate portion of the integuments.

tions, but his mind wandered a little on the 14th; the mucus in the bronchi increased, and he seemed about to die. I was inclined to open the tumour, but the wandering prevented it; besides this, we had no certainty of the abscess having adhered to the parietes. Pain sometimes shoots across into the hypochondrium, at other times into the right side of the chest. Respiration is distressed. The right lung is only traversed above the third rib, the rest of the right side of the chest sounds dull, and there is no respiratory murmur; respiration in the left lung puerile, and the peculiar crepitous bleating between the sixth and seventh ribs, above described, is rather less loud. There is a dark circle round the eyes, and a slight emphysematous feel over the abdominal tumour. Stools are slimy, brownish yellow, tinged with blood and mixed with pus. Much dejected, and will use no medicine.

As the tumour had made no progress I still considered it dangerous to open it, notwithstanding the edges felt hard, as if adherent; and proposed to cut down over the swelling, so as to lessen the thickness of the parts, and assist the progress of the matter to the surface, as recommended by Dr. Graves. This was accordingly done by Dr. Gualter, who cautiously cut obliquely across the swelling and the fibres of the rectus, down to the posterior fascia of that muscle, which, as well as the skin, was in a healthy state. The swelling protruded a little at each inspiration, and led me to think that there were adhesions. The

tension being removed appeared to give him some ease, but he died on the 26th, rather suddenly.

Dissection.—Dr. Gualter having kindly permitted me to examine the body, a mark was made on the place where the peculiar symptom which it is the object of this paper to point out, was observed. On opening the body, it was found that no adhesion had taken place between the abscess and the parietes of the abdomen. The liver was much enlarged, its substance rather soft, and the pale structure somewhat increased. The stomach was distended with air, and its pyloric extremity was pushed down towards the umbilicus, as was the colon, to which there were no adhesions, but its coats were slightly vascular, where they were in contact with the diseased viscus. The liver strongly adhered to the diaphragm, which it had pushed some way up, and had caused a partial absorption of its substance, as, on separating the lung, which also adhered, a gush of matter into the cavity of the pleura was caused by tearing its attenuated fibres. The right cavity of the pleura, as high as the third rib, was full of reddish serum, in which flakes of coagulable lymph floated, and recent and very tender adhesions existed between the lung and pleura costalis, and insulated in large irregular cells, quantities of the red serum. The lung, though compressed, was healthy, and the adhesions were easily separated from the healthy membrane, as if they had been deposited from the fluid. The adhesions to the diaphragm were dense. There were four ounces of fluid, containing a few flakes, in

the pericardium; and towards the right side it seemed to have partaken of the diseased actions. There was a slight recent adhesion of the thin margin of the left lung to the sixth and seventh ribs, at the spot where the sound was heard during life: the lung was well traversed and healthy, with the exception of an enlargement of some of the cells where it adhered. It was seen that the edge of the lung had been pushed against the side by the diaphragm, forced upwards by the enlarged liver. The heart and great vessels were healthy.

There were several large abscesses in the liver, of which one, in the convex surface of the right lobe, had nearly opened into the chest, and, as well as another in the middle of the left lobe, was independent of the one that pointed. The gall bladder was distended, and contained some bile mixed with much pus, which was found to have regurgitated along the cystic duct, and to have come from the abscess in the left lobe, by a branch of the left division of the hepatic duct. The small duct was carefully traced till it was seen to open into the abscess, the parietes of which were very irregular, from the unequal absorption of the hepatic substance. The abscess that appeared externally was situated in the anterior and superior part of the right lobe; and it was observed that the incision, which had in one point penetrated the posterior portion of the sheath of the rectus, had left a slight mark on the peritoneum covering the abscess, which, notwithstanding this, was smooth and healthy, and had been in no way excited by the

operation. The vessels, &c., of the capsule of Glisson were healthy. There was a very little water in the abdomen. The small intestines below the duodenum contained dirty brown matter; and the colon was studded with ulcers, especially near the rectum. The spleen, pancreas, kidneys, and bladder, were healthy.

This dissection, which was very carefully conducted by Dr. Gualter and myself, left no doubt that the very peculiar symptom of a loud sound, partaking of the character of a bleating and of an ordinary respiratory murmur, but audible at some distance by the bystander, and accompanied with a strong vibration of the part of the chest from which it proceeded, was caused by the thin edge of the lung being compressed against the costal pleura by the enlarged liver.

The same symptom occurs from simple enlargement of the liver, and a knowledge of it may be of use, both in relieving the mind of the sufferer, and in directing the practice in certain obscure cases.

In 1835, I was requested to visit a surgeon of the Madras army, who had for some time laboured under chronic hepatitis, attended with some enlargement of the viscus and febrile paroxysms. He informed me, that notwithstanding the judicious treatment pursued by his medical friends, he believed that an abscess had burst into his chest; and said that he heard a sound, and experienced a vibration, in the posterior and inferior part of the right side, which prevented his resting in the recumbent posture. I applied my hand to the part, and at once

distinguished the peculiar thrilling of the ribs I had observed so anxiously in M'Donald's case above related; and perceived by percussion and the stethoscope, that the lung was freely traversed, the respiratory murmur being louder than in ordinary respiration, and of the same character as in the former case. It could also be distinguished at some little distance by the naked ear, more especially when the patient lay on the back, a little turned to the right side. There was no ægophonism. Having explained to the patient M'Donald's case, I was able, by placing him in a sitting posture, to remove the symptom, and to let the lung descend a little further into the chest, and, by pressing the liver forcibly upwards, again to produce it, and so completely was the patient's mind relieved, that he amused himself by producing and removing, by various changes of posture, what he had taken for an intimation of approaching death *. His future history corresponded with the opinion I gave, and his recovery was progressive. In addition to the usual remedies, I recommended the patient to direct the treatment, as far as could conveniently be done, to check any inflammation that might lead to the formation of permanent adhesions; to which, in his case, there was an evident tendency, and to which various unpleasant symptoms frequently left

* In a case that occurred before I was aware of the nature of the symptom, the pressure seemed to be caused by a collection of hardened fæces in the right colon, which it was impossible to prevent occasionally taking place in an elderly man labouring under severe paraplegia.

by hepatitis, are usually, and I believe correctly, ascribed.

When enlargement of the liver takes place either from congestion or chronic inflammation of the right lobe, or abscess of its convex surface, the tendency to encroach on the cavity of the chest is so great, that I have found the use of percussion and the stethoscope lead to the detection of enlargement of the viscus, more frequently even than examination below the margin of the ribs. Hence the frequency with which abscesses cause adhesion of the diaphragm to the costal pleura, and then make their way through that muscle and the intercostal spaces, to the surface. In such cases, however, the chance of a successful result from operation is extremely small, as, owing to the great thickness of the parts through which the matter has to pass before it can be reached, it has for the most part, entensively wasted the substance of the liver, and by burrowing through its softer parts, produces irregular cavities, across which, bundles of vessels and membrane with portions of hepatic substance, usually pass. In such instances, adhesion has always taken place previous to fluctuation being perceptible, and the operation may therefore be performed without danger, and should on no account be deferred. A case has come to my knowledge, in which the matter burrowed amongst the external muscles, causing extensive sinuses, which could not fail to lessen the patient's chance of recovery.

The operation never fails to give great temporary

relief, by removing the pressure on the lung, which I have known to be pushed above the third rib, and on the evacuation of the matter to descend to the lower edge of the fifth, and resume its functions; the patient being at the same time enabled to extend his trunk and thighs, which were previously painfully bent forwards. I have, also, met with one person who recovered permanently, from an abscess opened in this situation.

It is in liver abscesses operated on in this position, that the peculiar corroding gangrenous ulceration, described by Mr. C. Hawkins, in the Medico-Chirurgical Transactions, Vol. XVIII., Part 1, most frequently takes place; and from not being aware that this occurs in common abscesses of that organ, even when the cavity itself has been nearly obliterated, that gentleman has considered the cases he has so well described, to have been examples of a disease to which he has given the name of "aqueous encysted tumours." I believe this intractable complication, usually arises, from the parts over the abscess having their vital powers diminished by the disease below, and thus being unable to sustain the irritation caused by the discharge from the abscess, which, in almost all protracted cases, becomes more or less sanious. In one instance, an abscess situated rather deeply in the substance of the right lobe, made its way anteriorly and pointed between the umbilicus and the margin of the ribs. A puncture was made, and reddish pus with thick diseased matter and sloughy membranes, to the extent of fourteen ounces, was discharged. He

sank in a few days. The original abscess situated in the substance of the right lobe, was of moderate size and contained good pus, but communicated with another cavity, partly filled with putrid sanies, formed between the surface of the liver and the two layers of peritoneum, which adhered together, but were broken down and sloughy. The integuments had also sloughed, the gangrene commencing in an old leech bite. These observations strongly enforce the propriety of opening abscesses in the liver appearing externally, as early as possible; although, I regret to say, that the chances of recovery are much smaller than could be inferred from the published records of cases, in which the operation had been performed.

But while satisfied of the propriety of making an early opening, when it can be done with safety, I think that the case above recorded will show, that when an abscess comes forward below the margin of the ribs, an operation should not be performed until the tumour has not only protruded, but decidedly *pointed;* as in such cases (and it is unfortunate that those are the examples in which recovery is most likely to occur) there is too often no adhesion of the covering of the abscess to the parietes of the abdomen; and notwithstanding the opinions of several authors to the contrary, it is impossible to believe that, in such circumstances, the pus would not be effused into the cavity of the abdomen and destroy the patient. During the time M'Donald's case was under treatment, a recruit of the Madras European regiment died of an abscess of the liver, which pro-

truded to a great extent below the margin of the ribs, and in which the matter appeared to be very near the surface. The skin over the part was tense, œdematous, and covered with enlarged and tortuous veins; and it was only after very anxious consideration, and chiefly on account of the otherwise hopeless condition of the patient, that I was deterred from operating; yet on dissection it was found, that no adhesion whatever had taken place. It is true, that there are few cases on record, in which death has occurred from the effusion of the pus of hepatic abscesses into the abdominal cavity, but such examples do occur both in this country and between the tropics, although it seldom happens that they are submitted to the public.

But not only are we unable, by the mere presence of fluctuation, to ascertain that adhesion has taken place, but, it is not always easy to be assured that we can reach the matter; even when it exists in large quantity. In 1823 I examined the body of an officer, who died of hepatic abscess, in whom it had been proposed to make an incision in the epigastrium, to evacuate the matter, but the measure was objected to by an experienced practitioner, who was consulted, and the operation was not performed. On dissection it was found, that the matter could not have been reached, and although I did not see the case during its progress, it was evident, from the appearance of the swelling in the dead body, that the mistake might very readily have been committed. I do not say, that this will happen in the practice of

men accustomed to treat deep-seated abscesses; but I have heard of cases where the melancholy error was committed, and it is therefore right to point out the possibility of its occurrence.

There is another point in the history of this case, which deserves attention. The partial evacuation of one of the abscesses through a small branch of the hepatic duct, causing some diminution of the swelling, shows the possibility of pus passing into the venous trunks, and thus being evacuated by the urine; and of late years, several experienced practitioners in India, have considered this to be a common termination of the disease. I have observed the large veins hanging loose into the cavity of abscesses, their coats unchanged, and their orifices only obstructed by soft and very slightly attached coagula of blood, which, in one instance, had given way, and hastened the death of the patient by hemorrhage into the abscess. But, although I have diligently looked for it, I have never discovered pus in the veins; and have found the puriform deposits in the urine, considered as pus derived from liver abscess, present in cases where no abscess existed; and in other instances, have ascertained the supposed pus to be secretions of a very different kind, yet, making every allowance for the many sources of error to which the observations in question are subject, the enquiry is one deserving of the utmost attention, and if the present state of science admits of it, a great benefit would be conferred on practitioners in warm climates, by a clear statement, from competent authority, of the

observations necessary to establish the fact, and the fallacies to which such observations are liable.

Notwithstanding the length to which this paper has already extended, I cannot conclude without expressing my opinion on the practice of giving mercurial medicines, where it is known that abscess in the liver has taken place, as is recommended in some works of authority, and appears to be much practised in this country. I have perused the histories of a great many cases, in which mercury in various forms was continued after the formation of matter, but have not met with one where it seemed to be otherwise than injurious, except, perhaps, where cautiously prescribed for other symptoms, supervening on some chronic cases; nor have I met in India, with any judicious practitioner of competent experience, who approved of mercury in any form, in such circumstances.

Wilton Crescent,
April 22, 1837.

NERVOUS AFFECTIONS,

PECULIAR TO YOUNG WOMEN,

CAUSING

CONTRACTION OF THE MUSCLES OF THE EXTREMITIES,

ACCOMPANIED BY

INCREASE, DIMINUTION, OR ABSENCE OF SENSATION OR MOTION.

BY JOHN WILSON, M.D.,

PHYSICIAN TO THE MIDDLESEX HOSPITAL.

READ MAY 23RD, 1837.

WINIFRED Dowty, admitted 28 April 1832, aged 24, single, ill ten days, with pain in the head and over the inferior margin of the right lobe of the liver, to the extent of a crown piece; catamenia always scanty, and often absent; subject to leucorrhœa; has been leeched, bled, and blistered without any relief.

A few days after admission, a pain came on in the right groin, as the pain in the region of the liver diminished; a fortnight after, the pain had extended from the right groin to the hip and down the thigh to the inside of the knee, followed by inability to move the right leg, or sustain any weight on it, with pain also in the occiput, and one of the inguinal glands hard and painful, with difficulty and pain in making water.

Hitherto, the chief treatment has been leeching, cupping, and mustard poultices, with the cold shower-bath, but she is now, the 14th August, in a much worse and more helpless state than when admitted.

The treatment was now changed, and two needles introduced daily from the hip down the thigh, in the direction of the pain, which remained in for two hours; ten days after could move the right leg and bear some weight on it; soon after was able to turn the toes out; the needles were daily continued to the middle of September, a moxa was applied above the spine of the ilium, and soon after she left the hospital perfectly recovered.

Rebecca Webster, aged 24, transferred from the surgeons' wards 16th March, 1833, where she had been for a fortnight. A month ago was seized with a pain in the left side and back, with inability to walk, which have continued ever since; catamenia absent four months, bowels confined.

Now, the pain of the loins, groin and abdomen of the left side so severe as scarcely to be able to bear the slightest touch, but the pain greatest over the left hip joint; that in the knee only slight; lies on the right side with the left knee bent up.

She was cupped over the loins to ℥xij, afterwards over the left hip joint to ℥xv, with relief: had large, frequent, and active doses of purgatives, which were long continued, as the bowels were obstinately costive; along with which, for three weeks, had carbonate of iron in ℥ij doses, thrice a day; two needles were introduced daily, from the hip downwards, for one inch

and a half in depth, and remained in for two hours. She had an attack of influenza, when the carbonate of iron was discontinued. While she was with us, she had three or four fits, which the nurse said were hysterical.

April 24.—Can walk well, goes into the garden every day; five days ago laid aside the crutches, after having used them only three days; discharged.

April 30.—Walked alone from the New Road yesterday, without either crutches or stick.

Louisa Charrington, aged 21, single, admitted 30th October, 1833; says she has been ill a week, with headache, cough, sore throat, pain in the left side of chest and short breath. Now, her complaints are the same, with sores about the mouth and face; catamenia scanty for some time past; bowels confined; great sensitiveness of the skin about the neck, chest, and abdomen; cough convulsive, like the barking of a dog; opens her mouth during inspiration, and closes it on expiration. Respiratory murmur heard all over the chest, as far as the cough permits examination.

A few days afterwards was unable to walk without assistance, which diminution of the voluntary power of inferior extremities continued till towards the last. At first she was freely purged, when the motions were dark and lumpy; enema assafœtidæ was given twice; tinctura lobeliæ inflatæ was given for the cough; afterwards the cold shower-bath was tried, when she fainted every morning after it, and shivering fits followed, which were succeeded by continual sickness

with frequent vomiting. The shower bath was omitted and hydrocyanic acid given to allay the vomiting and sickness.

December 13. Cough gone, only sick once a day, feels hungry, has the globus, cries, and complains of the headache, is flighty and sulky at times; suspicious of every one around her, cannot walk, and will not use crutches. We now returned to the cold shower bath daily, which, with the ferri carb. 3s. and ferri tart. ϑs. thrice a day, was continued to the 11th January, when she was discharged well.

M. A., aged 23, removed from the surgeons' wards, 20th November, 1833, had been previously delivered in August, and has been ill ever since with constant pain in the inside of the loins, on the left side, also over the region of the pubis; lies with the right heel and leg drawn up under the left thigh; bowels confined; catamenia have not appeared since her confinement, sense of choking, with a bitter water rising in the mouth; pain in the loins increased by pressure; for the three weeks past, urine has been drawn off by a catheter. She had one warm bath at first; then the cold shower bath every morning, with two needles every day to the loins, for two hours; every second morning to have, jalap. ϑj calomel. pulv. zingiberis aā gr. v.; the same powder was afterwards required every morning, after which she had 3j of carbonate of iron thrice a day;—at the end of three weeks the right heel and leg continued to be closely pressed to the left thigh; to prevent which, the emplastrum lyttæ cum euphorbio was ap-

plied to each of the parts in contact; the next day the empl. canth. was applied to the calf of the right leg; this caused a great discharge, of which she complained, as well as of the needles. The euphorbium plaster was afterwards applied to the calf of the leg, but during its discharge, she was excused taking the shower-bath; and when the parts healed, the double inclined plane was applied to the knee, the angle between the two planes being regulated by a screw; but this she found irksome, and soon learned to regulate the inclination of the planes at pleasure, by turning the screw. Occasionally, when suddenly alarmed, as upon the approach of her medical attendants, she vomited blood. She afterwards lost all feeling of the right toes when pinched; sometimes made water without the catheter, but the pain in the loins persisted; the leg, in six weeks from admission, by the aid of the screw, &c., was brought to an angle of 130° with the thigh.

January 27. Has been up every day for the last week, never has been dressed before since her illness; looks and general health greatly improved, leg nearly straight, continues the inclined plane in the nights, and walks with crutches in the days. Catamenia never appeared, vomited three ounces of blood to-day; a troublesome discharge from the vagina, with pain in the groin, hip, and knee of the right side. There was a revolt in the ward this morning, and I was obliged to let her be discharged, though reluctantly. She came to see me in April, walking quite well, and free from the least lameness.

Esther Brinfield, aged 20, single, came in on the 22d May, 1834. Ill a week, began with giddiness and violent pain in all the limbs; had shivering fits a few days ago, when she was insensible and knocked herself about; bowels and catamenia regular.

After she had been in a fortnight, paralysis of the inferior extremities came on; shortly after, she recovered the use of the right leg, but the left leg and thigh simulated all the symptoms of diseased hip.

When the paralysis came on, the cold shower bath was used, and continued till the 16th June, when she was discharged, having only a slight lameness of the left leg.

Cordelia Smith, a robust girl, aged about 20, was brought in a chair from the surgeons' wards the 15th December, 1835; a week ago fell on the back of her head, and has had pain there ever since, with frequent succussions of the whole frame; now lies in a state of torpor, bowels confined, catamenia regular.

The head was shaved, and a mustard poultice applied to the back of the head; afterwards the occiput was cupped to ℥xij, and fomented; and iodine ointment applied, hydr. cum cretâ gr. v. ter, and opening medicine.

Ten days after admission, she suffered severe and constant pain, with tumefaction about the occiput, shivering at times, and indistinct vision; keeps the eyes closed, feels soreness, on being touched, over all the body, with pain in the epigastrium, to which twelve leeches were applied with relief; the severe pain was not afterwards confined to the occiput, but extended over all the head, so that she could not bear

the ointment to be applied; on the 2d July, had a fit; the following day lay in a state of torpor, opening the mouth during inspiration and closing it on expiration, the head then not sensible on being touched.

January 25th. Vision continues indistinct, pain now confined to the right side of the head, and to the same half of the body; touching the hair causes soreness to the scalp; she evinces great sensibility to the slightest touch over the same entire half of the body, but the power of motion of the same side is diminished; a buzzing noise in the right ear; appetite good, but the same food sometimes tastes well, and at other times disagreeably.

The knee was still kept bent. The right knee to be stretched by the inclined screw plane; shower bath every morning; carbonate of iron 3jss. thrice a day; 2 needles for two hours every day; bowels were sometimes so obstinate that ext. of elaterium was given; moxa occasionally applied.

Feb. 26. For the last eleven days has entirely lost all sensation and motion of the right arm; two needles were passed into the arm, but she evinced no sensation when they were put in and taken out. Yesterday morning felt a great pain in the right shoulder, followed by a sense of numbness extending from the same shoulder to the finger nails; in the evening was able to bend the fingers but not the arm; head comparatively well, intelligence continues perfect; the right knee continues bent, and very sensitive to the touch. Some days afterwards she had another fit,

during which the right knee became straight, but when it was ended the right knee became bent again, and in some of the fits the knee could be placed in any position, as if nothing was the matter with it; she continued for some time longer to have severe fits, struggling, moaning, and screaming by turns; the respiration after them sometimes as high as 96. The most powerful remedy in the fits was the cold douche; in one of these fits six women and the house surgeon all pressed upon her to restrain the convulsions; two buckets of cold water were brought up, and an assistant standing on the bed with a jug full, allowed the contents gradually to fall over the face, breast, eyes, and particularly into the mouth when open; this was repeated in the strongest fits.

Afterwards, when she was improving, she was made to stand for half an hour every day on the right leg, with her back to the wall, and a bedstead pressed against the bent knee to keep it straight, the left leg being raised on a chair; the cold douche was applied in the bath every morning to the bent knee, and sometimes the shower bath afterwards to the whole body, after which she was made to walk, with assistance, along the ward, and sometimes, when she raised the right foot to bring it forwards, a kick was given to the heel, and thus it went much more forward than she intended or thought possible. Towards the evening, when tired and unable to walk more, she was seated upon a table, and a weight being tied to the right foot, she swung the leg back and forwards, thus giving motion to the stiff joint.

April 16. Going out to day, walks well, and is only lame towards the evenings; has free use and sensation of the right arm, pains of the head entirely gone, some slight dimness of sight only remaining; catamenia have all along been regular; since she has regained the use of her limbs the fits have been more frequent, but less severe; is very fat and in good health.

She shortly afterwards returned to see me, was very well, free from lameness, and had a situation behind the counter in a pastry-cook's shop.

Eliza Alston, aged 26, single, came in 29th November, 1835. Complains of pain and inability to move the right hip joint, which confines her to bed; left the hospital a week ago, having been in for three months for the same complaint. Now has pains down the dorsal and lumbar vertebræ on pressure, but most pain along the dorsal; great pain in the right hip and knee, which is much aggravated by the slightest percussion on the heel; right leg an inch shorter than the left; there is a tumour in the right hypochondriac region; frequently vomits all ingesta; catamenia regular.

She was cupped on the loins, and large enemata of oil of turpentine cleared the intestines, which were much loaded, and the tumour in the hypochondrium disappeared. One night, after an enema of four pints, containing two ounces of oil of turpentine, she fell asleep, and retained the whole injection till next morning, and no difficulty in making water followed.

Creosote and hydrocyanic acid were afterwards

given to allay the vomiting. As these symptoms subsided others appeared; at one time she lay on her back three days and nights motionless and speechless, with the eyes wide open and fixed immoveably on the ceiling, and nothing could turn the eyes in a different direction; the pupils were dilated and mouth open, which gave her a strange and unpleasant aspect, during which time she took no sustenance, excepting now and then a small portion of the fluids, which were put into her mouth, she swallowed; she passed nothing in bed; at stated times she was placed on the night-stool and there occasionally performed her wants.

At an early stage of this cataleptic or ecstatic state, she was seated at the bottom of a shower bath, but then only uttered some strange cries; again, when she had remained in that state for three days, she had cold water poured on her when in bed, which caused her to struggle and restored her to her senses when she said that she felt as if waking out of a sleep, and was conscious of nothing having passed, during the three days, till she felt the cold water being poured on her, though she had no recollection of having previously been in the shower bath.

Afterwards moxa and needles were applied; sometimes the needles were unscrewed from the handles and allowed to remain in all night; she was fat, lazy, and very difficult to manage, from having been so long in the hospital; she was made to walk with assistance round the ward, had the cold douche and shower bath, swung the leg with a weight to it; but

she found the most benefit, during the greatest part of the last six weeks, from being placed with her back to the wall, sustaining her whole weight on the lame leg, with the bedstead pressed against the knee; this was daily repeated for two hours at a time. She was able, before she left, to walk alone in the garden, without any support, and to put the heel to the ground, though still lame.

About a month ago, when she last called, she had a high heeled shoe and a crutch, which she had been using for some time; she was going to Margate to have the warm douche.

This the least satisfactory case that we have had, though there was more fear here, from the first, than in many others, that there might be some disease of the hip; and should it not be so, the lameness and contraction of the leg have been of long standing, which are against her. On the contrary, what may be regarded as favourable symptoms are, that she is highly hysterical, has much morbid sensibility, is in good health and fat, and has been able to walk alone since her first lameness*.

Sarah Hawkins, aged 21, single, admitted 17th September, 1833. Ill nine days; began with shiverings and violent pains from head to foot, which

* Since this paper was read I have again seen her; on her voyage to Margate, she suffered so much from sea-sickness, that while she was there nothing could be done with her, and she returned worse than when she went; but a few weeks after her return she was able to walk alone, without stick or crutch, pretty quickly, but unable to put the heel entirely to the ground.

came on after having travelled all night on the outside of a coach, when it was very wet.

Now complains of head-ache, and pain and swelling of the right knee, which is generally the most severe from eight to ten in the evening; some yellowness of the conjunctivæ; catamenia, generally about every third week.

She remained under my care for three weeks; was seen by the surgeons and removed to their wards, as it was supposed that there was some disease of the cartilages of the knee.

More than two years after, Feb. 9th, 1836, she was returned from the surgical wards, having, during the interval, been an in and out patient of the surgeons; but only once, for a short time, when at home, has she been able to set the foot on the ground.

For the last three months has not been able to relax the ham-strings, both of which have remained tense and hard, with much swelling of the right knee, and the sole of the foot turned upwards towards the face; general health good, catamenia every third week, but she is thin and hysterical, and has extensive tenderness along the spine.

A month ago, when in the surgical wards, she had a tepid shower bath; immediately convulsions came on, and the right thigh came up against the belly. In that state she would have remained, had not three women sat up with her for two days and one night, and, for a week afterwards, one person held the limb down, to prevent it from starting up again; after-

wards the leg was tied down to the bed with straps and rollers.

When she now came under my care, I placed her in a room alone, with a nurse to attend her, to prevent the excitement which might be caused by numerous spectators; the rollers and straps were abandoned; the leg was held as straight as could be permitted, and the cold douche uninterruptedly applied for a quarter of an hour: she then felt a violent pain in the leg and loins, the ham-strings began to relax, the leg to tremble, and very soon it fell down by its own weight. The limb was then well rubbed for twenty minutes; both the douche and the rubbing were continued twice a day for some days afterwards; on the fourth repetition, the foot assumed its natural position, which it has retained ever since: by pressing on the ham strings and knee, she was in some degree enabled to extend the leg.

A fortnight afterwards, she was enabled to walk with a crutch, and set the heel on the ground, with the toes turned outwards; but she has a dislocation of the joint of the great toe, of long standing, which, since her illness, has been very painful, so that she can bear no weight on it.

The last time she called, six weeks ago, said she had been able to walk across the room without a stick, but the knee-joint continued stiff.

Mary Ann Heard, aged 29, single, came in 28th of March, 1836. Ill three months with headache, lassitude, shortness of breath on going up

stairs, and palpitations; the left knee had been constantly bent for a fortnight, some time before admission, but she can now straighten it, yet the left leg is one inch shorter than the right. Complains most of pain in the left hip-joint, which formerly extended down to the inside of the knee and ankle; cannot bear any weight on the hip, and is confined to bed. Says she has been cupped three times over the hip; leeches applied every other day, for a long time; and blistered six times. She is now very pale, in a state of anæmia, has leucorrhœa; catamenia absent for two years; appetite bad; tenderness over the lumbar vertebræ.

When her strength was recruited, to which our treatment was first directed, the cold shower bath and needles were employed, and she ultimately took ℥ij of the carbonate of iron and gr. v. of the hydriodate of potass thrice a day.

At the end of two months, she could walk very well with a high-heeled shoe; and having an opportunity of going to Margate, we urged her to embrace it.

During her stay at Margate, she had a powerful warm douche applied to the sound hip. Two months afterwards, on her return, she walked quite well, with a low-heeled shoe, and free from all lameness.

Johanna Donahue, aged 18, single, came in on the 25th October, 1836. Nine months ago fell on the left knee; for a month afterwards was able to walk alone, but not without much pain in the knee; then

she went into a public institution, where she remained six months, but obtained no benefit, and left it on crutches, which she has been using ever since.

There is now only slight swelling of the knee, but it is stiff and painful in attempting to move the joint; catamenia regular; she is stout and healthy. The crutches were taken from her on admission, and she was led about the ward, supported by others, who now and then, when she was in the act of raising the left foot, propelled it forward by a gentle kick: at other times, when tired by walking, she sat on a table and swung the left leg with a weight tied to it; at another time, when she became able to bear it, after the cold shower-bath, she was placed, for an hour, with her whole weight sustained by the lame leg, and her back to the wall, and a bedstead to the knee.

At the end of three weeks she left us, walking quite well and alone.

Having been, perhaps, already tedious in narrating the history and treatment of the preceding cases, I shall now be the more readily excused from attempting to reason on the causes of these nervous affections.

The ancients thought that the uterus wanders about the body, giving rise to all the varied symptoms so commonly classed under the name of hysteria. The moderns deny this, and say that the same train of affections are produced by the nerves of the uterus communicating with the sympathetic, and thence with all the

other nerves of the system:—now, either description will amuse, but neither will much enlighten us.

But let us revert to those circumstances which we may observe so commonly in the class of disease just related.

Often we find the patient attributing the cause of her lameness to some accident, as a fall, knock, or sprain, about the time of the lameness first being noticed: and it is very natural that she should do so, for patients are often as ready with a theory of cause and effect as medical men: the patient, however, often deceives herself, for she may become lame without having received any external injury of the parts affected.

Again, they will often, at first, complain of the harsh treatment; and what is also remarkable, they will sometimes complain the most when the good effects of the treatment become visible, and do not seem to wish to be removed from that state, which ensures to them the attention and sympathy of those around.

But when you have by attention to all they have to say, and by kindness, accompanied by firmness, obtained a moral influence over them, which becomes a powerful agent when properly directed, they will often attend to your reasonings about their treatment, and aid you in fulfilling it; and should there be, at that time, a marked improvement, their anxiety for recovery increases; and though at first the treatment might have caused them much grief,

they now become grateful to you, and continue to have a great attachment to the wards, and to the nurses whom they have been under, and often return to pay them a visit after their recovery.

The facility with which this class of patients exercise a sympathetic influence over others is also remarkable; and even over the minds of nurses, who will be carried so far as to encourage them, by a ready attention, in their vagaries and fancies. Hence the nurses were of no use whatever in carrying into execution some parts of the treatment, and without the aid of the resident medical officers, a plan so troublesome, and continued for such a length of time as many of the cases required, could not have been executed.

In the cases related, the women were all young, generally in good health, and of strong constitutions: all of them were single, and many of them subject to violent hysterical fits. In the four most obstinate cases, the functions of the uterus were regular; in others, the bowels were confined, and in four of them obstinately.

Again, at times, some were seized with sudden and apparently alarming symptoms, as repeated hæmoptysis, most violent convulsive fits; others, on the contrary, had perfect paralysis of both sensation and motion; another lay motionless and speechless for three days: yet these symptoms only suspended, and never altered the treatment.

Lastly, I have preferred combining an outline of the treatment, with the history of each case, that

any one may the more readily adopt or reject what he may think proper, which he would not have been able so easily to do, had one general outline of treatment only been described; which must be my apology for having occupied so much of the time of the Society.

It should have been stated, that the cases have been taken from the case-book, in the order in which they occurred, without any selection, except in omitting those of less severity, which, in general, much sooner terminated favourably.

A REPORT

OF

A CASE

OF

SECONDARY MEASLES,

WITH OBSERVATIONS.

By JOSEPH MOORE, M.D.

PHYSICIAN TO THE ROYAL FREEMASONS' FEMALE CHARITY, VICE PRESIDENT OF THE PHRENOLOGICAL SOCIETY OF LONDON, ETC., ETC.

READ JUNE 13TH, 1837.

THE laws which influence the susceptibility of the body to, or confer immunity from disease, constitute a subject of speculation that has occupied the attention of pathologists in vain. Anomalies or deviations are occasionally witnessed, which set at nought the notions experience may have supplied to inquirers. The accumulation of facts, cannot but tend to establish a basis, upon which legitimate conclusions may be founded, and from which truth may, eventually, be elicited. With this view, the following communication is made; not from any practical importance its subject affords.

Miss E. F., aged 22 months, a somewhat strumous but otherwise healthy child, was observed during the nights of Monday and Tuesday, the 23rd and 24th

May, 1836, to be feverish; she having previously suffered from a hoarse dry cough, attended with drowsiness, loss of appetite, a white tongue, and a reddish hue of the tarsi, and palpebral conjunctivæ, unaccompanied by much lachrymation. Towards the evening of Tuesday, a few red spots appeared on the forehead, face, and neck; and a slight efflorescence was visible on the arms and chest. On Wednesday morning, after a very restless night, during which slight delirium prevailed, the efflorescence assumed the appearance of measles, consisting of irregularly diffused crescentic patches, leaving clear interstices. The forehead and hairy scalp were covered by the eruption, which was now become intensely red. The body and lower limbs were at this time slightly spotted.

During the succeeding days the disease pursued its usual course, but with more than ordinary severity. The eyelids were much swollen; the defluxion was considerable; and the cough and sneezing incessant. The eruption was very extensive, and the patches throughout, on the limbs as well as on the face and trunk, were elevated above the skin both to sight and touch. The velum and fauces were much inflamed and spotted.

By the 10th of June, every trace of disease had disappeared, and the child recovered her accustomed state of health; but all the other children of the family, (six in number,) were affected in succession with the measles, which displayed a severe character in every one, except an infant between

three and four months old, which refused the breast and exhibited slight restlessness, and a few specks on the neck and breast, for about 24 hours only.

On Sunday, the 31st July of the same year, I was again requested to examine Miss E. F., who during several preceding days had experienced an accession of fever, accompanied with drowsiness, a dry irritating cough, (from which she had been entirely free since the former attack,) tumefaction of the eyelids, intense redness of the conjunctiva, without defluxion, and the usual premonitory symptoms of measles. The rubeolous rash again occupied the face and chest. This in the succeeding days increased, and presented the characteristics of the eruption. All the other symptoms ensued in an aggravated form. By August the 9th, the disease having gone through all its stages, the child was convalescent; but the skin did not speedily resume its natural colour; a dusky hue rested long on the parts previously occupied by the eruption.

No seclusion of the children was enjoined during the prevalence of the disease. They occupied a well-aired suite of apartments, having a north and north-east aspect, in a healthy part of the metropolis. They had also free access to a separate dormitory, to which each child was confined in bed during the acmé of the disease. Measles, as an epidemic, did not prevail at the times above mentioned. Although there could be no doubt that this second disease was measles, I requested my friend Mr. Gaskoin, whose intimate knowledge of diseases of the

skin, entitles his opinion to the utmost respect, to visit this child; and his view was confirmatory of my own respecting the identity of the complaint.

I have been the more explicit in detailing the appearances which this case presented, from knowing that the recurrence of measles in a distinctly marked form, is denied by some *, questioned by many †, and only hesitatingly admitted by other practitioners ‡. Rosenstein says, "there is no probability of any one having been affected with the true measles more than once, provided the disease has had its perfect run, and has been thoroughly cured." . . . . . "During a practice of forty years, I never met with a single instance." § He remarks, somewhat ludicrously, "many may avoid it, (recurrence of measles,) by dying of some other disease in the mean time!"

Dr. Willan states, "after an attention for more than twenty years to eruptive complaints, having never met with an individual who had twice had the febrile rubeola, I am led to expect some mistake in the cases adduced, contradictory to this observation; a mistake likely to be made considering how difficult it often is to distinguish the measles from scarlatina." ||

* Rosenstein, Burserius.

† Willan, Good, Montgomery.

‡ Montfalcon, Bateman, Smith.

§ Spaarman's Translation, Ed. 1776.

|| Willan on Cutaneous Diseases, Ed. 1808. Note: This author, nine years previously, (Reports on the Dis. of Lond. 1799,) was "sorry to suggest the possibility that measles may occur twice in the same person, but had little doubt of it," &c. Subsequent experience led to the above quoted opinion.

A modern writer* likewise remarks, "The general law with regard to measles, is, that they affect the system but once, and this peculiarity is maintained with much greater strictness and fewer exceptions than the statements we are accustomed to hear in society would lead us to believe; very many indeed of the cases of secondary measles so reported, originating merely in the parties having confounded roseola, or some other cutaneous efflorescence with rubeola."

Although it must be conceded that instances of secondary measles have been noted; yet the cases were so vaguely described, and so imperfectly authenticated, that until Dr. Baillie †, in this country, called the attention of the profession to the fact of recurrence, no certainty with regard to it prevailed. Dr. Baillie did not witness all the cases he records during both attacks of the disease; but there can be no doubt from his reasoning, they were all genuine cases of febrile rubeola; and this is corroborated by the fact, that the contagion derived its influence in one of the instances from a secondary case. We are informed however that those who suffered severely, on one invasion of the complaint, had it mildly on the other; and inversely. Dr. Home ‡ indeed had previously made the following statement. "It was not an uncommon thing for them (measles) to attack the same person twice, of which I saw two instances. I

* Montgomery, Cyclop. Pract. Med.

† Trans. Soc. Improv. Med. Chir. Know. Vol. III.

‡ Med. Facts and Obs. pp. 278, 9.

was told some had them thrice" and we are led to infer the recurrence of the disease, in an inoculated patient, within about a week from the former attack. Dr. Home, however, did not conceive this the consequence of a second infection, but, agreeably to the notions of his time, that it resulted from the (morbid) matter not being carried off by the eruption; as the child "immediately after the first measles was seized with a swelling of the parotid gland." This notion that the contagion may exist in a concentrated form seems not to be altogether abandoned at the present time *.

Guersent has seen children afflicted with the disease twice in one year; and in one child the recurrence took place at the expiration of six weeks from the preceding attack. He, however, like most other authors, neglects to note the conditions under which the disease presented itself. The concluding member of the paragraph too, tends to invalidate the whole statement †. Rayer avers he has lately seen three instances of the recurrence of measles; one of them after an interval of three months from the first attack ‡. From this testimony, especially that of Dr. Baillie, together with the history I have just recounted, the inference is irresistible, that the possibility of measles occurring twice in one person, in a genuine,

* Elliotson, Med. Gazette, Vol. XI. p. 98.

† J'ai vu des enfans l'avoir (rougeole) deux fois dans le cour de la même année. Chez le même enfant, j'ai observé dans l'espace de six semaines, deux eruptions très regulières de rougeole; *separées par l'apparition d'une variété de variole.* Dict. de Med. Artic. Rougeole.

‡ Malad. de la Peau, Ed. 2.

well defined, and perfectly febrile form, is a fact which, although very rare, is fully established. In making this statement I have no intention of recognising as genuine measles, the instances of slight eruption without fever or catarrhal symptoms, or of slight constitutional disturbance with catarrh, but without eruption, adverted to by some writers *, which occur either sporadically or during the prevalence of an epidemic. These, equally, may be exhibited by parties who have undergone the disease, and confer no immunity upon those who have never experienced its influence. I am in like manner disinclined to accord credence to the recitals of which almost every practitioner's experience can furnish examples, where persons suffering from the disease have, it is alleged, undergone it at a former period. A rigid scrutiny often displays the truth regarding such instances; as either, that one of the attacks was imperfect in its character, incomplete in its progress, or occurred at a very early period of infancy, similar to that I have mentioned in this paper, whereby the system was not rendered insusceptible of a subsequent and more perfect disease; but above all, even those cases of alleged recurrence rarely communicate the disease to persons still liable to rubeolous infection, a most important and indispensable feature in purely contagious diseases.

The assemblage of symptoms in concurrent succession and in sufficient number, leaves little difficulty in establishing a diagnosis; but as this concurrence is rarely witnessed in practice, pathognomonic signs

* Sydenham, Burns, et alii.

have been sought for, to guard against error. The discrepancy in the opinion of medical practitioners relative to measles, would seem to indicate that a definite diagnosis is not yet established.

On the access of the eruption, so general and diffused is the efflorescence, in some cases, as to render it difficult to distinguish between measles and scarlatina. However ambiguous the former may appear, from the absence of those indications which usually characterize the complaint, I have never seen an instance in which congestion and redness of the conjunctivæ, especially of the lower eyelids, has not existed, and that too occasionally with very slight epiphora. Indeed, it would appear, as might be expected, that the less the lachrymal secretion prevails, the more marked is the turgescence of the palpebral conjunctivæ; hence this latter symptom may almost be considered pathognomonic. I have in several instances witnessed the continuance of this peculiar state of these membranes, when from the slight constitutional disturbance, and the subsidence of the other premonitory symptoms, an impression has arisen that the prognosticated disease was not to be measles. Sydenham writes, "lachrymarum in oculos effusio certissimum est signum morbillorum ingruentium."* Home considers sternutation an indisputable criterion of the approaching complaint†, and Mason Good appears to aver the same with respect to the

* Opera Medica, Ed. Genev., 1769, p. 120.

† Med. Facts, &c.

"stigmatised dots."* Some have regarded somnolescence, and others the peculiarity of the cough †, as certain indications of the approach or actual existence of measles.

Another feature connected with measles, which has been overlooked by some writers and denied by others ‡, is the cuticular elevation or prominence exhibited on the parts occupied by the eruption. In the case above recounted, as well as in other members of the family, this character was well marked on both occasions; and I have reason to believe a minute and cautious examination, will enable the observer to detect it in numerous instances. This prominence is very dissimilar from the tumefaction of the cutaneous surface, prevalent in small-pox and scarlatina, but which rarely occurs in measles, unless the febrile action be severe, and the eruption rapid in its progress.

The state of the fauces and velum constitutes another distinctive mark between genuine measles and scarlatina. In the former the redness is more diffused, is unaccompanied with swelling of the parts, and does not impede deglutition. No single symptom nor plurality of symptoms, except they occur in re-

* Study of Med. Vol. III. Art. Enanthesis Rubeol.

† Guersent Dict. de Med. Art. Rougeole.

‡ Maculæ rubræ et latæ superficiem cutis non superantes. Sydenham Op. Med.

Ces taches ne donnent pas sous le doight la sensation d'une surface inegale et prominente. Rayer Malad. de la Peau, Tom. I. p 18.

gular succession, and are accompanied with the usual concomitants, can with propriety be considered to constitute a specific disease. Had this view been rigidly adhered to, systematic writers would scarcely have been so ready to found a distinction upon slight shades of character, or to erect a few anomalous cases into a new variety. The Rubeola sine Catarrho of Willan, (R. Incocta of Good,) and the Rub. sine Eruptione of De Haen, Burserius, and others, are surely equivocal forms, and involve the question of diagnosis in inextricable difficulty, which will only vanish by denying the existence of such forms of disease, or admitting measles to be an idiopathic fever inducing local irritations, according to certain laws, with which we are at present unacquainted. This view receives confirmation from the impression now entertained, that measles may be communicated even before the eruption appears *.

* Rust's Mag. Feb. 1827.

REMOVAL

OF

THE CLAVICLE,

WITH

A TUMOR SITUATED IN THAT BONE.

By BENJAMIN TRAVERS, F.R.S.,

SURGEON EXTRAORDINARY TO THE QUEEN, AND SENIOR SURGEON TO ST. THOMAS'S HOSPITAL.

READ NOVEMBER 28TH, 1837.

A YOUNG gentleman, æt. 10, a native of the East Indies, but resident during the last five years in this country, stout made and healthy, was the subject of this operation. In the summer of 1836, a swelling, the size of a hedge nut, was discovered by his maid in washing him, on the centre of the left collar bone. It was firm, but not painful. Ten days previously, Master P—— had fallen out of a wheelbarrow in the garden while at play with a schoolfellow, and complained at the moment of having hurt his shoulder. A highly respectable surgeon of the neighbourhood was now requested to see him, and the following are, in his words, the impressions he received from a careful examination. "My opinion was, that a blow had been received upon the bone, and that inflammation and effusion under the periosteum was the consequence; but I did not think the bone had been broken through its whole substance; I considered it

inflammatory, and ordered leeches and cold lotions." A stellate bandage was afterwards applied, but the tumor increasing, Master P—— was brought to me for an opinion about two months after its discovery. It was then oval shaped, about the size of a pigeon's egg, firm but elastic, and painful only when compressed. The motions of the arm were quite unimpeded. It gave me the idea of a false joint after a central fracture, or at least of a cyst enclosing the broken and ununited portions of the bone.

Slowly but sensibly the tumor increased, retaining the character of a dense walled cyst; continued pressure by the pad and bandage was of no avail, and leeches and cold lotions, blisters, the mercurial and iodine ointments, successively employed, were equally ineffectual.

The lad's health continued undisturbed, but after some months the skin became slightly coloured from distension, and pressure was more painful. I introduced a grooved needle at the most elevated part of the tumor, and moved the point of it in a small cavity, an inch or more in depth from the surface. A few drops of black grumous blood were discharged. The notable changes in the progress of the disease, when of six months' standing, were the more advanced and somewhat undulating outline of the surface, and its more extended and fixed base, which could not be traced beyond an oblique line of discontinuity of the clavicle, distinctly perceived on the sternal side; at the scapular end the bone was absorbed in the tumor. In May of the present year, (1837,) the base of the

tumor from its scapular extremity occupied full three-fourths of the bone; about two-thirds of its circumference was supra-clavicular, so that, in the erect position of the body, it was seen by a person standing behind the patient over the fall of the trapezius. The skin had a purple hue from congestion of the superficial purple veins, but there was no sign of pressure on the blood vessels or nerves of the arm.

In a consultation with Sir A. Cooper and Sir Benjamin Brodie, it was determined to remove the clavicle and tumor connected with it, and assisted by the latter gentleman, I performed the operation on the 6th of June, 1837, about a twelvemonth from the date of its origin.

The little patient being recumbent, with his shoulders raised and head slightly averted, a crucial incision was made through the integument and platysma myoides, one limb of which was nearly in the line of the clavicle, and the other at right angles; and the flaps and fascial coverings successively dissected down to the external basis of the tumor. The pectoralis and deltoid muscles were then carefully detached from their clavicular origin, avoiding the cephalic vein, and the fibres of the trapezius and cleido-mastoid muscles divided on a director. One considerable vessel, in the situation of the transversalis humeri, required a prompt ligature. The circumference of the tumor was now well defined, though it was found to be firmly imbedded, and adherent on its posterior aspect. Disarticulation of the scapular extremity of the bone was next effected with-

out difficulty, and the mobility thus communicated to the mass facilitated the completion of the operation. A director was now worked beneath the bone, as near to the sternal articulation as was practicable, and with a pair of strong bone nippers thus introduced, it was completely and clearly divided. The sub-clavius muscle and a part of the rhomboid ligament were now detached from the tumor, and the mass being well raised by an assistant, while the edges of the wound were kept wide apart by metallic retractors, the cervical prolongations of the tumor were separated from their remaining connections by a few touches of the scalpel, without injury to the subclavian vessels.

The operation occupied some time, but the boy displayed good courage as it proceeded; very few vessels were tied, and the loss of blood did not exceed 12 ounces.

The symptomatic fever was smart, but perfectly manageable by the usual aperient and diaphoretic medicines, and the convalescence proceeded without interruption. Master P—— was removed to Richmond at the end of a month, carrying his arm in a sling, the wound being for the most part cicatrised. He has since remained in perfect health, and it is worthy of observation that there is scarcely any perceptible falling forward of the shoulder, nor any restriction of the motions of the arm; he elevates it perpendicularly over his head, extends it horizontally, carries and rotates it behind the trunk, and performs the same extent and variety of circumduction, and with equal promptitude and power as the parallel

movements of the other arm. Indeed, one of his amusements is rowing a boat upon the Thames. The production of bone of a cylindrical figure from the truncated sternal extremity of the clavicle extends at least two inches, and terminates beneath the centre of the cicatrix in a firm ligamentous band adherent to the skin.

Structure of the Tumor.—The tumor presented on its anterior aspect a regular curvilineal surface, posteriorly it was irregular, dipping in prolongations between the interstices of the cervical muscles, to which it was firmly fastened. This difference is at once explained by the resistance of the platysma and strong fascia supporting it in front, and the yielding of the intermuscular spaces below. A very dense fibrous expansion invested it on all sides, and from a puncture of the principal cyst in the operation, the same dark grumous fluid exuded as followed that made by the needle three months before. The section of the tumor in its longest diameter presented an arrangement of cells or chambers, of pretty equal dimensions, filled with dark solid coagula of blood, the edge of the scalpel grating as it passed upon particles of osseous matter. One larger compartment, deeply situated, was without a clot, having been filled with the dark fluid blood before mentioned. The investing membrane was evidently the condensed periosteum, the cells were the irregularly expanded cancelli, and the calcareous particles were the débris of the bony plates and walls.

Here then was a blood tumor of the bone, com-

mencing in its medullary structure and inducing an equal absorption of its earthy material. What was its nature and origin? Was it osteo-aneurism, or a passive hæmorrhage from rupture of a vessel of the medulla, or an undetected and ununited fracture of the bone, the periosteum remaining entire? No reasonable doubt, it appeared to me, could exist on two points; first, that it began in the cellular structure; secondly, that it was the result, direct or indirect, of the fall.

If it belonged to the class 'osteo-aneurism,' as described by M. Breschet*, to which its structure offers the nearest analogy, I should say that it wanted the ordinary character of aneurism in being painless, at no time communicating the faintest pulsation, and on section not presenting any laminated fibrinous deposit, or trace of inflammation, other than the periosteal cyst thickened after the manner of a hernial sac. The simplest reading of the case is, that a medullary extravasation had taken place from the concussion attending the fall, or from a fracture within the periosteum, in either of which cases the effused blood, which in a perfect solution of continuity of the bone would have been absorbed, acted as a foreign body upon the surrounding textures, and by effectually stopping the osseous secretion and starving the bone, became the instrument of the absorbing process. Nor does it appear how in such cases the process of union should

* For a careful collection of these cases, with an interesting account of their pathology, see a 'Probationary Surgical Essay,' by P. D. Handyside, M.D., Edinburgh, 1833.

take place. According to the invariable law of tumors, the natural defensive process is set up in the external wall, whether the work of construction or destruction is proceeding in the interior, from the mere expansion of the part. But whether concussion or fracture had been the origin of the effusion which, retaining fluidity in one larger compartment, formed compact clots in the remainder, it is clear that in this case, the periosteum, being continuous, had not secreted bone, but organizable lymph agglutinating it with surrounding membranes, and that neither any process of preservation nor of active destruction had taken place in the bone, but a mere shelling of the animal structure by the removal of the earthy cells and walls. The inorganizable, yet inoffensive character of effused blood, when unexposed to air, could alone have originated and maintained this passive condition.

It must be admitted, however, that the actual origin of this, as of many results of remote injury, is conjectural, and that present appearances do not always afford sufficient criteria for retrospective explanations. The bone aneurism is often devoid of pulsation, pain is not a constant symptom, and the history of the disease does not, I believe, offer a single example of its occurrence in the clavicle, with which to compare that here recorded. The size and situation of the bone affected by this disease may much modify appearances.

The youth and the constitution of the patient, however, the chronic march of the disease, its non-inter-

ference with health, and the uniform and complete disappearance of the bone from the tumor which occupied its place, coupled with the absence of all inflammatory action, or secretion, strongly impress me with the belief that its origin was the simple local one which I have attempted to describe; viz. a casualty attended by circumstances in which nature was unable effectually to relieve herself; and that the denomination of aneurism, would therefore convey an erroneous, as well as painful impression of its nature.

I meet with four cases of the removal of the clavicle. One for a caries of the entire bone done in the hospital at Zurich in 1822, by a single incision along the lower edge of the bone without hæmorrhage or difficulty of any kind. The patient was afterwards able to perform all the movements of the arm forwards, backwards, and upwards. He continued his avocations, and died six years afterwards of phthisis*.

Three operations for osteo-sarcoma of the bone are on record. The first dates more than a century back; it was performed by Mohring, who was I believe a Prussian surgeon. I have been unable to trace the reference which is given in Dr. Otto's Compendium of Pathological Anatomy. (Kulmus resp. Mohring D. de exostosi steatomatodé claviculæ, ejusque felici sectione. 4to. Gedan, 1732.)

The case of Dr. Mott, of New York, occurred in the summer of 1828, and is given, though abridged from the Medical Repository of that city, in ample de-

* Journal der Chirurgie und Augenheilkunde. Lond. Med. Gazette, Vol. XIII. p. 63.

tail, in the London Medical Gazette*. The tumor of the left clavicle is described as being four inches in diameter, of a conical figure and incompressible hardness, and consisting of a bony cup, cartilaginous, or semi-osseous towards the centre; the two ends of the bone being movable upon one another, so that its proper structure was entirely destroyed. The operation appears to have been performed with skill and courage, and was doubtless a difficult one. The case terminated most successfully†.

Dr. Warren, of Boston, another distinguished surgeon, and like the former, my friend and fellow student, contributes the fourth case. This was also an osteo-sarcoma. The tumor, in its greatest transverse diameter, measured 7 inches, was hard, and conveyed

* Vol. III. p. 405.

† In a letter which I recently received from Dr. Mott he refers to this case in the following words. "The young man upon whom I operated on the 17th of June, 1827, has ever since enjoyed excellent health. Subsequently to the operation he studied divinity, and is now a clergyman in Charlestown, South Carolina. I have seen him several times since his recovery, and there is no falling of the shoulder nor any alteration in his symmetry. As the bone was removed from opposite the coracoid process to the articulation with the sternum, I have not found any attempt at a reproduction from the scapular extremity. The mass removed was nearly the size of my two fists, the chasm was prodigious, and from being in an ulcerated and bleeding state the cicatrix of course would be very large. The firmness and size of this seems to be a great support to the shoulder. The subclavian artery, as it passes over the first rib, can be seen beating distinctly under the cicatrix. The support which I gave the shoulder by an apparatus for a year after the operation, contributed greatly to preserve its natural position.

an indistinct pulsation, being situated at the sternal end of the right clavicle. The operation was happily performed and concluded, but the patient exposed himself to cold on the 13th day, and died in the fourth week from the operation, of pleuritic inflammation. In both of these cases the acromial extremity of the bone was sawn through with a chain saw, and the sternal end in the first disarticulated; how it was detached in the second, is not mentioned. In both, the external jugular vein was tied.

Dr. Warren, a sound authority, considers the osteo-sarcoma to have its origin in the periosteum, not in the bone.

Dr. Otto says—"Vices of texture occur proportionally but rarely on the collar-bones; however, rickety expansion, erosion from aneurism, caries, necrosis, and osteo-sarcom have been observed."*

Reflecting on the simple origin and nature of the morbid change, as I have ventured to explain it, in this specimen, and the serious aspect it presented to us in consultation, as a probable osteo-medullary fungus of a malignant character, or a spina ventosa of the affected bone, or a formidable disease of the soft parts secondarily affecting the bone, it seems to me more than probable, that many of the anomalous fixed tumors on record have their origin in changes within the medullary canal of the bones as in the cavities and chambers having bony walls, viz.

* Compendium of Pathological Anatomy, p. 217; by Adelph Wilhelm Otto, M.D. Translated from the German by J. F. South. 1831.

the sinuses of the head and face, which are exasperated into intractableness by their confined situation, and complicated by the changes they produce in the surrounding parts.

There can be no doubt that injuries, more serious in their consequences than those of fracture and displacement, are often inflicted upon bone; as when adhesive, (i. e. ossific) inflammation, the only healing process of which bone is capable, is prevented by the circumstances of the injury, or on the other hand, is set up in preternatural situations or in morbid excess. Sometimes a bone is killed outright, sometimes disorganized only in part, by a blow or a fall; and the particular circumstances which, in such cases, determine the separated periosteum, or the deranged cancellary membrane, to secrete bone or to secrete pus, to generate osteo-sarcoma or the medullary fungus, are not merely local, but constitutional. The differences which induce in one case interstitial ulceration, (caries,) in another progressive ulceration or detachment from the living margin, (exfoliation,) in a third, a process of renovation simultaneous with the disorganizing process, or a transfer of the nutrient action from one set of secreting vessels to another, at the expense of the original structure, (necrosis;) all these differences lie open for investigation under the general head of diseases of the bone from mechanical violence, apart from section, fracture, and displacement. They have hitherto escaped description, if not notice, under this head, being for the most part produced by causes apparently so inadequate and indirect, as to

evince a morbid state of the constitution in the individual.

The following categorical summary I think my own experience will enable me to verify; the records of surgery would do so abundantly.

1. Periosteal inflammation and bony accretion or deposit upon the surface of the bone, with and without previous suppuration.

2. Inflammation, terminating in abscess of the periosteum or cancelli.

3. Inflammation, and ulcerative interstitial absorption of the bone (caries).

4. Rupture of the periosteal vessels and partial absorption of the bone, or rupture of the blood vessels of the cancelli, and extravasation and absorption of the entire bone.

5. Osteo-aneurism, or aneurism of the capillaries within the bone.

6. Death, and exfoliation of a portion of the bony shell.

7. Disorganization, and separation by ulcerative progressive absorption of the entire shaft after the deposit of a periosteal shell (necrosis).

8. Disorganization, and death of a defined portion of the entire cylinder of the long and entire substance of the flat bone, and consequent external abscess.

9. Exostosis, periosteal or medullary, or osseous tumor of the long and flat bones.

10. Spina ventosa, or inflammatory and sanguineous deposits in the cells of the articular extremities

of bones, irregularly expanding them, and ultimately reducing the walls of the bone to a net-work, crackling upon compression.

11. Osteo-sarcoma, or cartilago-osseous tumor of the periosteum and surrounding textures, secondarily implicating the bony, and contiguous soft structures.

12. Malignant, or medullary and hæmatoid fungus of the cancelli, and deposit of new septa or new exterior shell.

Postscript.—May 1, 1838. As nearly a twelvemonth has elapsed since the operation was performed, I may add, that the subject of it remains in perfect health, and has the full and free use of the arm.

A CASE

OF

UNIVERSAL PURULENT DEPOSITION INTO THE JOINTS,

WITH

SEPARATION OF THE EPIPHYSES;

OCCURRING AS A SEQUEL TO SMALL POX.

By HENRY ANCELL, Esq.,

SURGEON TO THE WESTERN GENERAL DISPENSARY.

READ NOVEMBER 28TH, 1837.

Sophia Middleton, the daughter of a poor woman, was nourished partly at the breast and partly on farinaceous food, and although pale in the face, and somewhat weakly and backward, enjoyed good health until above eleven months old, her flesh being at this age mottled and firm, and her limbs strong, so that she could support her own weight upon the ground.

At this time the child fell ill with the small pox, the eruption came out very full, but was distinct, and the crusts fell off about the tenth day. At the decline of the eruption, the whole body swelled, but in a short time it became very rapidly emaciated. About three days after the crusts had fallen off, she appeared to suffer violent pain on the slightest motion, and swellings were observed over the clavicle,

and upon the joints of the elbows, wrists, and knees. This took place upon the thirteenth day from the first appearance of the eruption, and three days afterwards she was presented as a patient at the Dispensary. The history was given by the mother, who further observed, that she was passing enormous quantities of fetid and high-coloured urine.

The child presented a most pitiable aspect, being emaciated and deadly pale, and loaded with recent cicatrices from desquamation after small pox. There were large, pale, cold, more or less circumscribed fluctuating swellings, streaked with blue veins, around the elbow, wrist, and knee joints, on the inside of the left ankle, and over the articulation of the right clavicle with the scapula. The swelling on one wrist was larger than an ordinary sized hen's egg, and on pressing the finger towards its centre, it appeared to contain a hard foreign body with an abrupt edge. Very distinct crepitation was observable in various situations in all the affected joints. The knees presented to the hand a sensation exactly as if the bones had been crushed under some considerable weight. A distinct grinding of two surfaces of bone could be produced about an inch below the head of the left tibia. Crepitation was also felt at the articulation of the ribs with the vertebræ. The deposition into the joints continued to increase for ten days; the smaller joints of the carpus, metacarpus, and phalanges became involved in the disease, and the ends of the bones appeared to separate more and more from each other. An abrupt edge of bone was perceptible

through the skin, one third the distance from the condyles towards the head of the right os humeri. Strabismus and other cerebral symptoms supervened, and in a few days afterwards the child died.

On dissecting the left knee, a considerable quantity of fat was found under the cutis, and the muscles of the thigh and leg were pale, small, and flabby; on opening the capsular ligament, the parts within were found to be surrounded by thin pus to the amount of about three ounces, the purulent fluid extending a third the length of the femur upwards and a considerable distance down the tibia; the body of the femur was separated from its epiphysis; the osseous portion of the epiphysis was quite separate from the cartilaginous portion, and a large portion of the surface of the latter presented a dull and slightly granulated appearance, as if worm-eaten; the cartilages and ligaments of the joint were undistinguishable. The head of the tibia presented similar phenomena, being distinctly separated from the body of the bone by a stratum of pus. There was no appearance of morbid vascularity either in the bones or in the capsular ligament.

On opening the calvarium, about six ounces of limpid fluid escaped from between the membranes of the brain, and a small quantity was found within the ventricles. The brain and its membranes were free from morbid vascularity.

The remaining viscera and joints were not examined, in consequence of strong objections urged by the mother.

The above is a well marked case of a pathological condition, which has been more frequently alluded to by authors, than described. The older writers mention a separation of the epiphyses as a frequent consequence of small pox in children, and as a symptom of scurvy, and Morgagni gives an instance of an experienced surgeon having mistaken a case of this kind for fracture. Many of the latest writers omit to enumerate this affection of the joints, either as a symptom of the secondary fever or as a consequence of small pox.

This affection is usually slighter and more partial than in the instance above related and the patients generally recover; two cases of the kind occurred to Mr. Anderson, Surgeon to the Dispensary. I have thought that the universal lesion of the joints, and the opportunity which was afforded of inspecting one of them after death, in this particular case, would render it interesting to the Society.

Albion Street,
August, 1837.

REPORT

OF

TWENTY CASES

OF

MALIGNANT CHOLERA

THAT OCCURRED IN THE SEAMEN'S HOSPITAL-SHIP,
DREADNOUGHT*,
BETWEEN THE 8TH AND 28TH OF OCTOBER, 1837.

By GEORGE BUDD, M.B. F.R.S., Physician,

AND

GEORGE BUSK, Esq., Surgeon,

TO THE DREADNOUGHT.

READ DECEMBER 14TH, 1837.

The person in whom the disease first shewed itself was A. J. Bernet, aged 18, who was admitted on the 29th of September, the day of his arrival from Dantzic, on account of a lacerated wound of the scalp. On the third of October he became feverish, and on the following day, erysipelas appeared about the wound; it continued to spread until the 8th, when it occupied the whole of the hairy scalp. He was confined to his bed, and was on low diet.

* H. M. S. Dreadnought, three decker, is converted into a hospital for seamen in the port of London, and moored off Greenwich.

In the night of the 8th, was seized with cholera, of which he died, at eight P.M. on the 11th.

The second person attacked was Michael Wisdell, 25, a strong muscular man, who was admitted on the 5th of October, 14 days after his arrival from Quebec, on account of venereal sores and bubo. His treatment had been local, his general health was good on the 9th, and he was on ordinary diet. At 3 A.M. on the 10th, he was seized with vomiting and purging of bilious matter, with very severe cramps in the abdomen and limbs. The evacuations towards the evening were liquid and white, with flocculi. The urine was suppressed; there was deafness, loss of voice, vertigo; the surface became cold, and the features collapsed. The vomiting continued twenty-four hours. In the morning of the 11th, the evacuations were again bilious, and at 10 P.M. he passed some urine for the first time since his attack. Diarrhœa continued two or three days, during which his pulse was intermittent, and he was discharged on the 19th, well.

The 3d and 4th cases occurred in the nights of the 10th and 13th. The fifth case was that of James Thomas, 21, a strong, florid, healthy looking man, who was admitted on the 2d of October, ten days after his arrival from Dantzic, with chancres and bubo. His treatment was local, and he was on ordinary diet. General health unimpaired up to the 14th of October; in the evening of that day diarrhœa occurred, and occasional vomiting; he made no com-

plaint until the next morning, when cramps supervened. The matters ejected were not kept.

October 15th. 9 A.M. Surface generally blue and cold; tongue and breath cold; pulse scarcely perceptible; complains of frequent vomiting and purging, and cramps; pulse more developed after a warm bath.

10½ A.M. Lying with eyes closed; lips very livid, skin of the fingers shrivelled; cramps in the hands and arms; constant jactitation; tongue less cold; voice not weak; pulse 120, just perceptible: complains of headache, and a sensation as if his ears were stopped. Matters vomited are yellowish and bitter.

2½ P.M. Surface generally very cold: lips, nose, and tongue blue; pulse imperceptible; occasional cramps in the abdomen; vomiting has ceased; diarrhœa continues; stools liquid, colourless, with white flocculi in suspension.

The vomiting did not recur; the stools became less frequent, and at 7½ P.M. is the following note—four stools since 6 P.M., colourless with flocculi; pulse felt in the right arm, which is under the bed-clothes, but not in the left, which is exposed. Pain in the region of the liver and nowhere else. (Treatment, large doses of calomel and stimulants.)

He rapidly sunk; at 9 P.M. pulse imperceptible; at 11 P.M., violent cramps in the neck and throat; at 11½ P.M. he died. No urine from the time of attack.

Case 6th. George Abbs, 18; in port of London

from Richebucto, since the 22d of August. Admitted on the 16th of September, with periostitis and impetiginous eruption. Ordinary diet.

Was nearly well on the 14th of October, and his general health good. About 4 A.M. on the 15th, was seized with vomiting and purging. At 8 A.M., cold perspiration and dizziness, with partial deafness; about 9 A.M. violent cramps supervened, which were confined to the lower extremities. At this time, lips and countenance blue; tongue livid, whitish on the upper surface, moist, not cold; pulse 108, scarcely perceptible; matters vomited reported colourless, and insipid; has passed some urine in the morning.

2½ P.M. Cramps extended to the abdominal and thoracic muscles; surface much colder; pulse less distinct; no vomiting; a constant flow of liquid from the intestines, with brownish flocculi in suspension.

The stage of collapse was progressive; the vomiting and cramps remitted occasionally. At 9 A.M. on the 16th, is the following note.—Skin blue and cold; no pulse; vomits every thing he takes; diarrhœa profuse; stools characteristic of cholera. The calomel, of which he had taken large doses from the beginning, rejected from the stomach enveloped in viscid mucus, but otherwise unaltered.

In the course of the day, there was a slight return of pulse at the wrist, and the surface was not quite so cold; evacuations thicker and resembling gruel; a sensation of heat, though his surface was cold. Frequent and painful cramps.

At 9 A.M. on the 17th, he was cold, blue, and without pulse at the wrist; half comatose; eyes suffused; no vomiting or purging for some time past; no urine for 48 hours; refuses all food. At 1 P.M. he died.

It would be tedious to give the details of any more cases, as the preceding are sufficient to shew the identity of the disease with cholera, as it appeared in London, in 1832. We shall content ourselves, therefore, by presenting a tabular view of the remaining cases, and by mentioning the following circumstances, which, from their illustrating the history of the disease, seem to deserve notice.

In the 7th case, the evacuations, after having consisted, during several hours, of the whitish or gruelly fluid, said to be characteristic of the disease, assumed a peculiar character; although still profuse, they became brown or blackish, from the suspension in the colourless liquid of brown or black flocculi, sufficiently numerous to impart their colour to the whole mass. When poured on a filter, a colourless fluid transuded, and the brown or black flocculi remained on the paper.

In the 8th case, the dejections, continuing in other respects characteristic, were observed to become brownish at a later period of the disease; they consisted of a thick red fluid.

Evacuations of a similar character were noticed in cases 6 and 13. In all, they appeared after a prolonged continuance of the rice-water discharges, and seemed to owe their colour to the elimination,

through the intestines, of the red particles of the blood*.

It will be seen from the tables, that these cases offer examples of cholera occurring in conjunction with each of the following diseases: typhoid fever, acute and chronic rheumatism, erysipelas, ague, dysentery, syphilis, and gonorrhœa.

(During former epidemics of cholera, the disease has occurred in the Dreadnought in persons affected with fever, cynanche tonsillaris, rheumatism, scurvy, and diabetes mellitus. In the subject of the last mentioned disease, the urine, which, before the attack of cholera, was highly saccharine and enormous in quantity, was as completely suppressed as in the others. This man remained in the ship a fortnight after his recovery from cholera; at the end of this time, the inordinate secretion of urine had not returned.)

The 4th and 16th cases were interesting, as shewing the influence of cholera on the rheumatic affection. The subject of the 4th case, was labouring under rheumatic fever of a severe form. On the 13th was totally unable to move his legs; both knees were much swelled, presenting an evident sense of fluctuation, and were protected by a cradle. At one P.M., on the 14th, 13 hours from the attack of cholera, it was noted that he was in a state of jactitation, and

* Evacuations presenting the same appearance have been noticed by Dr. Graves, of Dublin, who, in a lecture recently published in the Medical Gazette, ascribes their colour to the acetate of lead which he administered to his patients.

moved his legs freely; that the swelling of the right knee had quite subsided, and that of the left diminished. On the 16th, the swelling of both knees quite subsided, the pain in them ceased, and no traces of the rheumatic affection left. The knee joints were examined after death, and found to contain no fluid, but small shreds of white false membrane adherent to the synovial surface. The subject of the 16th case was admitted on the 19th of October, on account of a rheumatic affection of the joints, which had continued for ten weeks, during the last four of which he had been unable to walk, and had, in consequence, been confined to his hammock. At the time of his admission, was unable to walk, to extend his legs, or to clench his fist; complained of pain in the limbs, worse at night; there was tenderness, principally confined to the joints. In the night of the 21st, was attacked with cholera. On the 23d could move his legs freely, with scarcely any pain. On the 4th of November, was walking about the wards, presenting very slight traces of his rheumatic affection.

The following points of his former history are also interesting. He stated that he had twice previously been affected with cholera at Calcutta, that he was attacked, for the first time, while on board his ship, and subsequently conveyed to the hospital, on the 17th of May, 1831, two days after his arrival at Calcutta; for the second time in July, 1833, three weeks after his arrival at the same port; that each of these attacks was more violent than the present, (the

vomiting, purging, and cramps more severe,) and that in each he was treated by violent rubbings, brandy, and opium. This man recovered, and during his convalescence was several times questioned respecting the circumstances of these attacks, of which he always gave us the same account.

The 17th case, the one most rapidly fatal, occurred in a negro, a native of Congo.

Mortality.—We have already said that the number of cases was 20; of these, 12 proved fatal; but there was a remarkable variation in the mortality. Thus, of the 10 persons first attacked, 8 died, while of the remaining 10 cases, 4 only proved fatal. The number of these cases is, perhaps, too small to justify us in drawing any conclusions from this circumstance. It may, however, be remarked, that it is confirmatory of an opinion sanctioned by previous experience, that epidemics are milder and less fatal towards their conclusion; especially, as this variation in the mortality cannot be ascribed to any difference in the treatment adopted, or in the previous condition of the patients.

Treatment.—The treatment, in most of the cases, consisted in a bleeding at the commencement, when practicable; in the administration of large and frequently repeated doses of calomel; and, during the cold stage, in attempts to restore the temperature of the surface and alleviate the cramps, by means of frictions, hot-air baths, &c. The general result is unsatisfactory, and is rendered still more so by an inspection of the table, which discloses the humiliating

fact, that one half of the recoveries took place in cases comparatively mild.

Pathology.—The bodies were carefully examined after death in 11 of the 12 fatal cases; in all with the exception of case 9. The following is a summary of the appearances which they presented.

The only circumstances noticed in their external condition were rigidity and a violet colour of the back—the rigidity being generally greater, and the intensity of the violet colour less, as the bodies were examined nearer the epoch of death.

Organs of Digestion.—The appearance of the external or peritoneal surface of the stomach and small intestines varied, as the patients died at a period more or less remote from the attack. In the cases most rapidly fatal, or during the stage of collapse, they were observed to be viscid, and of a pale rose colour externally. The viscidity became less remarkable or disappeared, and the rose colour was replaced by their ordinary grey tint, in those cases that proved fatal after decided reaction. The large intestines were grey externally in every case.

The mucous membrane of the œsophagus was vascular in its lower portion in case 8 alone; in all the others, pale and healthy; studded with enlarged flat mucous follicles in its lower third in 17 cases; presenting a slight enlargement of the follicles in its upper part in 11.

The stomach was generally large; its mucous membrane pale in three cases, (7, 14, 16,) in the

others, presenting a greater or less degree of redness, which could be seen to depend on the injection of very minute vessels on its free surface, either in the splenic or pyloric extremity, or both. Its consistence was carefully examined in all the cases, and in none presented any remarkable change; it appeared, however, to be softer than natural in the splenic extremity in 1, 3, 8, 11.

In most cases it was more or less mammellated, this appearance being either general, or confined to the pyloric extremity. In 7, 14, by drawing the coats of the stomach between the finger and thumb, and using some pressure, a milky fluid was made to exude, and the mammellated appearance destroyed; the mucous membrane of the portion so treated afterwards appearing smooth, and of normal thickness and consistence. This was not the case in 17; the mammellated appearance could not be destroyed, nor any fluid expressed. In this case, the mucous membrane was coated with very viscid, firmly adherent mucus, but there was none adhering to it in 7, 14.

The general contents were similar to those evacuated during life, and require no particular notice; there were some adherent patches of mucus, in which calomel was entangled, in 5; a few ounces of thick, grey mucus, not adherent, in 16; an universal coating of viscid, adherent mucus, in portions of which calomel was enveloped, in 17.

The condition of the duodenum was not noted in 1, 3, 4.

Its mucous membrane was vascular in 5, 8; pale in 6, 14; greyish in 7, 8, 17; this greyness resulting from minute black specks at the apices of the villi.

Nothing unusual was observed in its texture, excepting in some cases, perhaps, a greater friability than natural.

In every case in which it was examined, solitary glands were very conspicuous, giving the membrane more or less of a granular aspect: these were in all cases more numerous near the pylorus, and in none extending into the jejunum.

In 14, the villi of a white colour were remarkably distinct, and, on pressure between the fingers, yielded a milky fluid.

The orifice of the biliary duct was observed to be unusually prominent in 5, 6.

The mucous membrane of the small intestines was pale throughout in 3, 7, 14; but there was generally increased vascularity, giving rise, in some cases, to a purple colour, in portions here and there, especially near the termination of the ileum. It was observed to be grey from minute black specks in 7, 8, 17; this greyness was general in 7, 8, confined to the jejunum and upper part of the ileum in 17. It will be remembered that, in 7, 8, the discharges during life contained brownish or black flocculi.

In case 11, in the lower portion of the ileum, the mucous membrane was generally softened, and presented seven or eight small ulcerations, which probably resulted from the typhoid affection of which this man

was the subject. In the other cases, the texture of the mucous membrane had undergone no appreciable change.

The glands of Peyer were remarkably developed in all the cases, and the most so generally in those that proved fatal rapidly, or during the stage of collapse. They were of the same colour as the surrounding membrane, but in two cases, (6, 8,) in which this colour was red, the tint of the patches was observed to be deeper. When pale, they were in all cases dotted with black points. The glands of Brunner were observed, in every case, in the lower portion of the ileum, as small elevated beads, of the same colour as the membrane. These, as well as the glands of Peyer, were the most developed in the cases that proved rapidly fatal, and in all these sufficiently so to give a sensation of roughness to the finger passed over the membrane.

The contents of the small intestines were found tinged with bile in none of the cases that proved fatal within thirty-six hours, but more or less so, with one exception, (case 8,) in all those that were more protracted. This tint was confined to the jejunum in 3, 6; to the ileum in 7. They were brownish in the jejunum in 7, 8; of a plum colour, evidently from the admixture of blood in the ileum, in 8.

In most cases, the mucous membrane was more or less coated by a pasty substance.

The mucous membrane of the large intestine was, in most cases, pale throughout; observed to be red-

dened from vascularity in some of the protracted cases only (1, 8, 11). This redness was confined to the first portion of the intestine in 1, 11; general in 8, but more intense in patches, and on the surface of these patches were streaks of effused blood.

Conspicuous follicles were observed in the large intestine in all the cases, with one exception, case 16. They occurred as flat, slightly elevated circles, about a line in diameter, with a central black speck, and, in every case, diminished in number, and were less conspicuous as we receded from the cæcum.

One small ulceration was found in the cæcum, in 11; and, in 14, in the transverse and descending colons, there were many, none of them larger than the surface of a split pea, most of them much smaller, with smooth edges, and apparently in process of cicatrization. The ulceration in the former case was probably the result of the typhoid affection; those in the latter of the dysentery, of which these patients were respectively the subjects.

The cæcum and ascending colon were generally distended; this was not the case with the descending colon, which, in several of the examinations, was observed to be contracted.

The mesenteric glands were enlarged in almost every case; in some, they were purplish, in others, pale.

The liver presented nothing remarkable. The gall-bladder was distended with dark bile, in every

case, with the exception of 3, in which it contained pus, and presented numerous ulcerations of its mucous membrane.

The spleen was of natural size or smaller than usual, and firm in 1, 3, 5, 6, 7, 8, 16; of a light red colour in 5, 7, 8, 16; its colour not noticed in 1, 3, 6. It was unusually large in three cases only, 11, 14, 17; soft and dark-coloured in 11; soft, and contained a purple creamy fluid, which could be expressed, leaving a white spongy substance in 14; firm and dark-coloured in 17.

The appearances noticed in these three cases seem to depend on causes foreign to cholera: the subject of the 11th case was affected with typhus, of the 14th with ague, and that of the 17th was a native of the western coast of Africa.

Organs of respiration.—The condition of the lungs varied as the patients died more or less remotely from the attack. They were found healthy, or simply congested, in four of five cases that proved fatal within thirty-six hours; while of six cases, in which the patients lived at least forty-five hours after the attack, four presented pneumonia. In one of these (8), fatal at the end of forty-five hours, the pneumonia was very partial, interlobular, and confined to the lower lobe of the right lung; in two, (4, 7,) fatal at the end of 96 and 138 hours respectively, the lower lobes of *both* lungs were found in a state of red hepatisation. In all these cases, the pneumonia was latent; there were no symptoms indicating its presence, and, while the patients lived,

we had no suspicion of its existence. We were not aware at the time these patients were treated, that the same observation had been made by Mr. Jackson, in his Report of Cholera in Paris, in 1832. By him, pneumonia was found to exist in one half of the cases that proved fatal after reaction, and in all these, it was latent. This is unquestionably, as Mr. Jackson remarks, the most important fact, with reference to practice, that dissection has as yet disclosed, and shows us the necessity of investigating by auscultation the condition of the lungs in all cases in which reaction has been established.

With the exception of old adhesions, there was no affection of the pleura in any case.

Heart. There was a small quantity of serum in the pericardium in two cases only, those the most rapidly fatal (14, 17).

The muscular substance of the heart was generally flabby and purplish, and in two protracted cases (4, 8,) it presented ecchymosed spots on its surface.

The contents of the ventricles were noted in ten cases. There were fibrinous clots in the left ventricle in two cases only, and those protracted (4, 8); in the right ventricle, in 3, 4, 5, 8, 14, 17.

In 4, the clot was firmer, and in 8, larger in the right ventricle than in the left. In all the other cases, the cavities contained a greater or less quantity of dark fluid, or grumous blood, which had communicated no stain to the lining membrane.

The kidneys were observed in every case, and in none presented any thing unusual in size or texture.

The cortical substance was purplish throughout, or pale, and presenting dark congested vessels in most of the cases. In all, with one exception, (case 6,) a white, puriform fluid could be expressed from the mammillary point. The urinary bladder was empty and contracted in all those who died during the stage of collapse; it contained a small quantity of urine in some of the others.

The head was examined in six cases (1, 5, 6, 7, 8, 14). In 1, 6, nothing remarkable was observed; in 5, 8, the vessels of the dura mater and of the hemispheres were congested, the cortical substance of the brain unusually dark coloured. In 8, the surface of the brain was viscid; in 14, there was a considerable serous effusion under the arachnoid, and in the sheath of the spinal chord. In 7, no vascularity of the dura mater; the surface of the brain exsanguineous, the cortical substance not darker than natural; on the inferior surface of the left anterior lobe, were two slight depressions on the surface of the brain, the largest having the area of a sixpence, both coated by a yellowish transparent substance, and apparently the result of old sanguineous effusions.

Besides these cases of decided cholera, three cases occurred in the medical ward of violent vomiting and purging, which continued some hours and then ceased, without having assumed any characteristic appearance, or without being attended by any considerable collapse. A great number of other patients became affected with diarrhœa, during the same period. Mention is made of this in the notes of the

medical ward in seven cases, but it occurred in a much greater number, and from our attention being concentrated on severer cases, was not noted. Similar circumstances were observed in the surgical wards. They are probably attributable to the influence that produced cholera, and serve, perhaps, to shew that this influence was more general than would be imagined, from the number of cases in which unequivocal symptoms of this disease were manifested.

This view is confirmed by pathological considerations. The intestinal canal was carefully examined in every person who died in the ship during the prevalence of cholera, and in several who owed their death to various diseases, and who, during life, had manifested no symptoms of cholera, an unusual development of the intestinal glands was noticed. It would occupy too much space to enter into the details of these cases; we proceed at once, therefore, to the consideration of the causes of the disease.

Causes. The disease cannot be attributed *solely* to any general atmospheric condition, for the following reasons.

1st. All the cases occurred in persons previously in the ship, in a population of about 200, while not a single case was admitted from the ships in the river, in a population fifty times as great, sending nearly all their sick to the Dreadnought.

2d. Not a case occurred on board the Marine Society's ship, the Iphigenia, moored at the stern of the Dreadnought, and consequently subject to the same general atmospheric influences. The population of

the Iphigenia is 107, of whom 100 are boys, whose average age is about 15, all healthy subjects. When sufficiently ill to require constant attendance, they are sent to the Dreadnought. This immunity may be partly owing to age, especially as it was observed, when the disease prevailed in 1832, that children were attacked less frequently than adults. This cannot, however, be the sole cause, as the subject of the ninth case was only 18, little above the average age of the boys of the Iphigenia. It is worthy of notice that during the epidemic in 1832, when cases of cholera occurred in almost all the vessels in the river, the Iphigenia enjoyed the same immunity. We can only account for this from the favourable hygienic conditions of youth, good food, and clothing, regular exercise, free ventilation, and complete separation of the sick.

3d. No case, that we can learn, has occurred in Greenwich Hospital, subject to nearly the same general atmospheric influences, in a population of 2,700 pensioners, between the ages of 50 and 80, besides officers and servants. The same cause of exemption does not hold here, as the disease was observed, in former epidemics, to be both more frequent and more fatal in old persons.

We must, then, seek for the immediate cause among the circumstances peculiar to the Dreadnought.

1st. *Infection from foreign ports.* If the disease was brought by any of those who experienced it, it was most probably by Bernet, in whom it first shewed itself. He left Dantzic on the 8th of

September, and no case of cholera occurred in the vessel in which he sailed; so that, on this supposition, the disease, in him, must have had a period of incubation of thirty days, a circumstance very improbable if we consider that the second and third cases occurred in the two following nights; that the five persons seized on the 21st and 22d had come from the four quarters of the globe, and consequently could not have brought the disease, and at the time of their attack had been in the ship from two to seven days only; and that the whole duration of the visitation was only nineteen days.

The only other person of those affected by the disease, who can be supposed to have introduced it, is Thomas, the fifth attacked. He also came from Dantzic, but he arrived in port seven days before Bernet, and had been in the hospital twelve days at the time of his attack.

It may be supposed possible for the disease to have been brought by a person who did not himself experience it. This is rendered less probable by the measures that are always taken with respect to the clothes of the patients. These, as soon as the patients have reached the beds allotted to them, are taken by the nurses and delivered to the boatswain, who keeps them in large lockers appropriated to this purpose under the forecastle, and returns them to the patients on their discharge.

The following is, however, the evidence on this head. From the 1st of September to the 12th of October, were admitted 334 patients. Of these, 158

came from English and Irish ports, 98 from ports beyond Europe, and 78 from European, including Mediterranean ports. We have carefully examined all the latter, and have included in the following table the names of the most suspicious persons,—the port from which they last sailed,—the number of days since their arrival in this country, and their diseases.

Date of Admission.	Name.	Port sailed from.	How long in port before admission.	Disease.
			Days.	
Sept. 26	J. Stokes ..	Hamburgh .	1	Venereal.
—— 27	J. Reis	Memel	3	Orchitis.
Oct. 4	J. Aiken ..	Hamburgh .	1	Fever.
—— 7	J. Archer ..	Rotterdam .	3	Bubo.
—— —	J. Grigg ..	Dantzic....	8	Fever.
—— 9	W. Bryan..	Hamburgh .	3	Gonorrhœa.

In the latter end of August and the early part of September, cholera was prevalent at Berlin; and, by enquiries made through the mercantile house to which the ship that brought Bernet was consigned, we have learned that some cases occurred about the same time at Dantzic; but they were too few in number to excite attention, and the Prussian consul in London received no information respecting them.

2d. *Infection from one person to another in the ship.*

The two following circumstances afford, perhaps, the strongest argument against this mode of propagation.

1. None of the nurses or medical men were at-

tacked; the latter lived on board, and were constantly employed in attending these patients, and in making the examinations after death, about each of which a considerable time was spent, and which were conducted in the lowest part of the ship, in a small cabin in which all the bodies were deposited.

2. The disease was not propagated from the Dreadnought. During its prevalence there, patients were almost daily discharged, who immediately entered other ships in the river, but did not in a single instance communicate the disease to their crews.

The remaining evidence on this point is best expressed by the accompanying tables *, one of which represents the three decks, with the position of the bed occupied by each patient at the time of his attack; the other, the day and hour in which this attack took place.

It appears from these tables,

1°. That 1 case occurred in the convalescent or spar deck.
3 in the upper deck.
8 in the lower or middle deck.
7 in the orlop or lowest.

The remaining case was that of the boatswain, whose cabin is under the forecastle.

Now, on the 12th of October, there were 60 patients in the upper deck, the one appropriated to surgical cases; 54 in the middle, or medical deck; and 58 in the orlop deck, in which are placed patients that require the least attention.

* See the end of the Paper.

The disease then, although the first case occurred on the upper deck, prevailed most in the middle and orlop decks.

2°. That the first case occurred in the upper, the second in the orlop, or lowest deck, and the third in the middle deck; and that only three cases occurred in the upper deck, in which the disease first shewed itself, and these in the nights of the 8th, 15th, and 16th.

3°. That all the patients, with the exception of one, the date of whose attack was not well marked, were seized in the night, reckoning as such the time from 5 P.M. to 7 A.M. In this interval the attacks seemed pretty evenly distributed, equal numbers (6, 6) happening before and after midnight; the date of the others some time in the night not specified.

Giving the above definition of the night, the cases were distributed as follows:

1 in the night of the 8th.
1 ..... 9th.
1 ..... 10th.
1 ..... 13th.
2 ..... 14th.
5 ..... 15th.
1 ..... 16th.
1 ..... 17th.
3 ..... 21st.
2 ..... 22d. { The precise time of attack of one of these not specified.
1 ..... 23d.
1 ..... 27th.

Since the night of the 27th, no fresh cases have occurred.

Thus it appears that there were two active periods of the disease, the nights of the 14th and 15th, and those of the 21st and 22d. In these nights nearly two-thirds of the cases happened. In the first of these periods, five out of seven cases occurred in the orlop deck; in the second, all occurred in the middle deck.

The preceding facts are not very favourable to the supposition that the disease was brought from abroad, or propagated by contagion in the ship. The influence on which it depended seemed to act with an intensity variable, but generally greater in the lower decks; and, in almost all cases, its effects were first manifested during the night.

We proceed to examine some other circumstances which may be supposed to have conduced to the greater prevalence of the disease in the lower decks.

Ventilation.—As this is effected principally through the port-holes, it is most efficient in summer, when these can be kept open and a current of fresh air allowed to pass through the ship. Now, during the fortnight which preceded the appearance of cholera, the weather had been remarkably fine and mild, and the ventilation of the ship in consequence as good or better than it usually is at that season. With respect to the relative ventilation of the different decks, it is unquestionably, from its position and the smallness of the port-holes, less perfect in the lowest or orlop deck. The only advantage which the upper has over the middle deck consists in its greater elevation.

Crowding.—The patients are always, from the

number requiring admission, more crowded than it is perhaps desirable they should be, but, at the time when the disease broke out they were not unusually so. The number of patients on the 13th of October was 181, greater by 27 than at the corresponding time last year, but considerably less than the number frequently on board, and, as we have already seen, they were pretty evenly distributed in the three decks, which do not materially differ in size.

Condition of the Hold.—On the 21st of October, two extra labourers, two or three men from the ship, and the quarter-masters in rotation, in all seven or eight persons, were employed to pump out the bilge water and to clean the hold, a process which occupied them nearly a fortnight. Fires were lighted there, and the hold, as well as the decks, has since been whitewashed. The bilge water was in the condition in which it is usually found; a candle lowered into the well burnt clearly, and nothing was discovered in the condition of the hold that could in any way account for the disease. The boatswain, however, who superintended this process and slept under the forecastle, was attacked in the night of the 23d. All the labourers escaped; their hours of work were from six in the morning to six in the evening.

Predisposing Causes.—The food of the patients had evidently no share in the production of the disease. Of those attacked,

1 was on full diet.

11 were on ordinary or half diet.

2 were on milk diet.
2 ..... milk diet with arrow root.
3 ..... low diet.

The scale of diet is more liberal than those of the London hospitals, in consideration of the habits of sailors, whose daily consumption of food is much greater than that of the lower classes in the metropolis.

Previous Disease.—Five out of eight cases in the medical ward occurred in persons previously affected with diarrhœa. This was not the case in the other wards. Six of those attacked were in the hospital or slight venereal affections.

Previous condition as to force.—The disease did not attack the debilitated principally. This will be seen by reference to the cases; but it appears also from the circumstance that it was prevalent in the orlop deck, which is tenanted by the most robust patients. But, although the previous condition as to force seems to have had no influence on the frequency of the disease, it had a marked one on the mortality. This was greatest and the most rapidly fatal cases happened in the medical ward, where cholera generally occurred as a complication of some visceral disease, and in patients previously reduced in strength.

Previous Medical Constitution of the Ship.—From a review of all the cases admitted into the medical ward throughout the summer, it appears—

1. That the number of admissions into that ward has been nearly uniform, except in the month of July,

in which it was considerably less than in the other months.

2. That typhoid fever has been almost uniformly prevalent. Most of these patients were remarkably spotted, and the affection was of the type described by Huxham as jail fever. They were all admitted labouring under the disease. In no case did the disease shew itself in persons previously in the ward for other complaints, although this happened to two patients in the surgical wards.

3. That acute affections of the intestines, which were rare in the months of May, June, and July, became frequent in those of August and September. Under this head are comprehended cases of enteritis, or simple fever with diarrhœa, and common diarrhœa; and, for the month of August, four cases of cholera, two of which proved fatal.

The first of the fatal cases occurred in Edward Bowen, 50, negro, who was admitted, in a state of collapse, on the 5th of August, 14 days after his arrival from the Isle of France. He died at 7 in the morning following his admission. No account is preserved of the condition of the intestines.

The second of the fatal cases was that of Peter Johnstone, 61, who was admitted on the 12th of August, 14 days after his arrival from Leith. He was seized in the night of the 10th, and died in the night after his admission. We should be occupying too much space by entering into the details of this case, and shall merely remark that it seems impossible to distinguish it from those that have recently occurred

in the Dreadnought, or to consider it essentially different. The symptoms during life—the nature of the evacuations, which were without bile—the appearances after death; but especially the unusual development of the agminated and isolated glands in the ileum, occurring, too, in a person of his age, are sufficient to establish their identity.

The two remaining cases were slight, and the patients did not present the symptoms of *malignant* cholera. The 1st of these was J. Austin, 22, admitted on the 8th of August, 14 days after his arrival from Sierra Leone; the 2nd, J. Aplin, 21, admitted on the 29th of August, 7 days after his arrival from Weymouth.

All these patients were admitted labouring under the disease.

In the month of September no case of cholera occurred, but a case, which, from its resemblance to some noticed by Dr. Roupell, as having preceded the cholera in 1832, is perhaps worthy of being mentioned. It is that of

Simon Sturrock, 46, a remarkably robust man, from Arbroath, and in the port of London since the 7th of September. He was quite well up to the 13th, when, at 1 P. M., he was seized with purging, which was succeeded by vomiting, cramps, urgent thirst. The purging, at first excessive, ceased at 4 A. M. on the 14th, but vomiting, with occasional hiccough, continued to the 20th, the day of his death, when he gradually sank, after passing a considerable quantity of blood by stool; no purging immediately

preceded this occurrence. We have omitted, for the sake of brevity, the details of this case, which resembled one of malignant cholera in the violence of some of the abdominal symptoms, and in its fatal issue; but the aspect of the patient, the character of the evacuations, the dark crimson velvety appearance of the mucous membrane of the last foot of the ileum, and of the ascending and transverse colon, noticed after death, and the absence of conspicuous intestinal glands were, we imagine, sufficient to shew that it was of a nature essentially different.

In all former visitations, cholera prevailed in London as well as in the river; in the one that forms the subject of this paper, it existed in an almost isolated manner, in the Dreadnought. About the same time, there are said to have been five or six cases at Limehouse, and we have been informed by Dr. Sims that a few cases occurred in the St. Mary-le-bone Infirmary; but we cannot learn that the disease existed in any other part of the metropolis. It is singular that when cholera first shewed itself in London in 1832, within a few days of its appearance in the river and at Limehouse, and before other parts of London were infected, some cases occurred in Marylebone, the part of the metropolis most removed from, and maintaining the least intercourse with, the former places.

It is worthy of remark, that during the summer of 1837, cholera prevailed extensively in Italy; and that, following the law of its first diffusion, it had been marching towards us for several months, appear-

ing in succession at Naples, Rome, and Berlin, before it shewed itself in the port of London.

RECAPITULATION.

1st. The disease, which recently prevailed in the Dreadnought, was identical with cholera, as it appeared in London in 1832; and, although it occurred in an almost isolated manner, and had no power of spreading, the individual cases were as severe as in former and more extensive epidemics.

2d. Cholera may affect persons labouring under various diseases, acute and chronic, and may attack the same person twice or more; circumstances in which it seems to differ from typhus, which rarely occurs in complication, or more than once in the same individual.

3d. The evacuations in cholera, which are ordinarily composed chiefly of the serous portion of the blood, occasionally contain, when the cold stage is protracted, the red particles.

4th. During the prevalence of cholera, diarrhœas, attended in some cases with vomiting, were frequent in the Dreadnought, and probably resulted from the cause that produced cholera.

5th. The recoveries took place chiefly in robust subjects, and in cases comparatively mild; but debility, although rendering the disease more fatal, did not seem to predispose to its attacks.

6th. The dissections in these cases confirm the important observation of Mr. Jackson, with respect to

the frequency of pneumonia, and the latent form in which it exists, in cases that prove fatal after reaction.

7th. As no case occurred on board the Iphigenia, moored at the stern of the Dreadnought, or in Greenwich Hospital, or in other vessels in the river, the disease cannot be attributed *solely* to any general atmospheric influences; but no obvious local cause could be assigned for it either in the crowding or ventilation of the Dreadnought, the diet of the patients, the condition of the hold, or the previous medical constitution of the ship.

8th. The shortness of the interval between the occurrence of the 1st case and that of the 2nd and 3rd; the circumstance that persons, recently arrived from various and distant countries, were attacked within a few days after their admission into the Dreadnought; but, especially, the short duration of the epidemics, are unfavourable to the supposition that the disease admits of a long period of incubation. The last circumstance, the short duration of the epidemic, is, we conceive, of great force, as it shews that of all persons attacked during the epidemic, after the first, not one presented a long period of incubation.

9th. The circumstance that none of the nurses or medical attendants of the Dreadnought were attacked; that the disease was not propagated from the ship, although patients were almost daily discharged, who immediately entered other vessels in the river; the order in which the cases occurred, the 1st, in the upper deck, in the night of the 8th, the 2d, in the lowest deck, in the night of the 9th, the 3rd, in the

middle deck, in the night of the 10th, and the disappearance of the disease at the end of three weeks, although no measures of seclusion, with respect to these patients, were taken, militate against the idea of its contagious nature.

10th. We can scarcely infer that the disease was brought from abroad, without admitting it to be contagious, and that it had, in the person who brought it, a period of incubation of, at least, 30 days, which is extremely improbable if we consider that this, at any rate, is a circumstance of very rare occurrence, and that only a few cases happened at Dantzic, the port from which this person last sailed.

11th. The history of the disease in Europe, in 1837, presents an epitome of that in 1832; its gradual advance towards this country probably depended on the same or similar influences in both cases.

TABULAR VIEW OF THE CIRCUMSTANCES OF ATTACK.

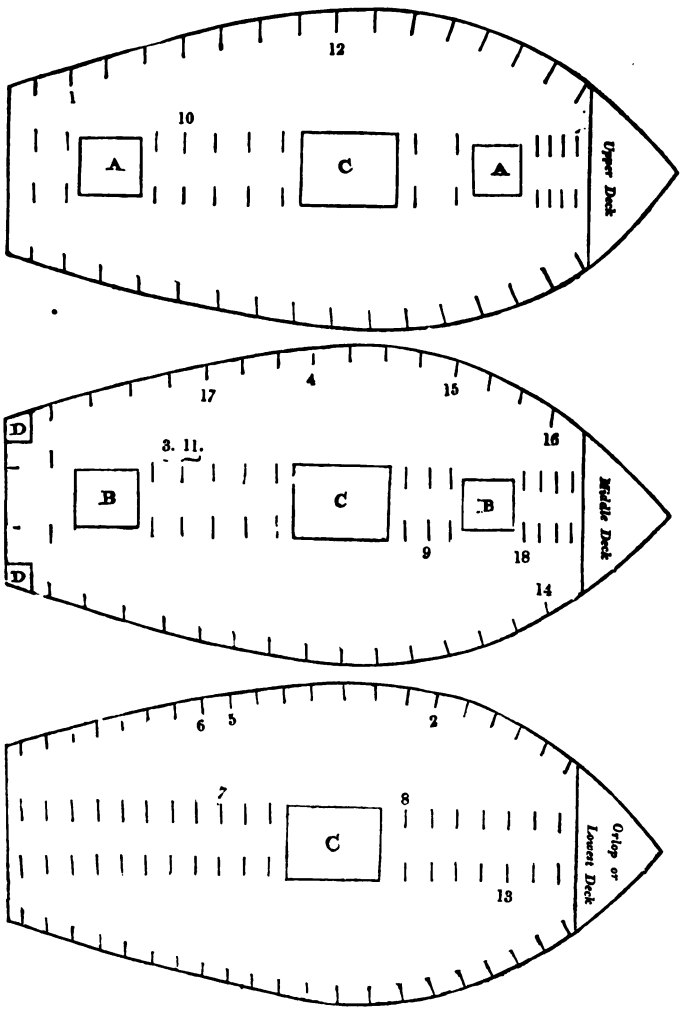
No.	Port last sailed from.	How long in port before admission.	How long in ship bef. attacked.	Date of attack.	Hour of attack.	Deck.	Bed.
1	Dantzic.	Same day.	10 days.	Nov. 8	In the night	Upper.	2
2	Quebec.	14 days.	4—5	10	3 A.M.	Orlop.	134
3	Newcastle.	1 day.	19	10	Evening.	Lower.	87
4	.....	Many months	4—5	13	12 P.M.	Lower.	69
5	Dantzic.	10 days.	12	14	Night.	Orlop.	127
6	Richebuctoo.	25 days.	30	15	4 A.M.	Orlop.	126
7	Black Sea.	.....	15	15	Evening.	Orlop.	149
8	Honduras.	16 days.	12	15	Evening.	Orlop.	146
9	Bangor.	Same day.	9	15	Night.	Lower.	97
10	Bristol.	3 weeks.	16	15	Night.	Upper.	26
11	Petersburg.	1 day.	17	16	Morning.	Convalescent; transf. to lower	87
12	Malta.	.....	54	17	5 A.M.	Upper.	9
13	Petersburg.	6 days.	20	17	Night.	Orlop.	173
14	N. Orleans.	Same day.	7	21	6 A.M.	Lower.	103
15	Calcutta.	———	2—3	21	8 P.M.	Lower.	73
16	Seaham.	7 days.	4—5	22	3 A.M.	Lower.	76
17	Rio Pongo.	14 days.	3	22	5 P.M.	Lower.	66
18	N. Orleans.	Same day.	7	22	.....	Lower.	99
19	.....	.....	12 years.	23	Evening.	Private Cabin.	..
20	Hamburg.	5 days.	5 days.	27	Night.	Orlop.	..

TABULAR VIEW OF THE CASES.

No.	Age.	Disease when attacked.	Condition as to force when attacked.	Diet when attacked	Circumstances of the Cases.	Result.
1	18	Erysipelas from injury.	Confined to his bed.	Low.	Soon fell into a state of collapse, in which he lingered till the time of his death.	Death, 68 hours after attack.
2	25	Venereal sores.	Good.	Ordinary.	Attack sudden; evacuations bilious for many hours; then choleric; cramps very severe; no urine for 43 hours after attack.	Recovery; convalescence rapid.
3	18	Admitted on account of hemetemesis.	Walking about in seeming convalescence.	Ordinary.	Attack sudden; evacuations bilious for many hours; then choleric; no cramps; did not rally from the stage of collapse. Gall bladder found extensively ulcerated, containing pus, but no calculi.	Death, 33 hours after attack.
4	22	Acute rheumatism.	In a state of fever.	Low.	Attack sudden; symptoms severe; early collapse; at the end of 48 hours, reaction established; evacuations again bilious; afterwards, in a semicomatose state, with occasional muttering; pulse 72—80; skin warm; eruption of minute papulæ on the forehead.	Death, 96 hours after attack.
5	21	Venereal sores.	Robust.	Ordinary.	Did not rally from the stage of collapse; symptoms severe; no urine from the time of attack.	Death, 24 hours after attack.
6	18	Trifling.	Good.	Ordinary.	Attack sudden; symptoms severe; at the end of 10 hours, stools contained brownish flocculi; at the end of 34 hours, slight and transient reaction; no urine for 48 hours.	Death, 57 hours after attack.
7	20	Gonorrhœa.	Good.	Ordinary.	Extreme collapse; at the end of 50 hours, purging ceased; vomiting excessive; matters ejected enormous in quantity, and containing blackish flocculi. This continued for 40 hours. At the end of 60 hours, reaction established: afterwards in a semicomatose state; skin warm; pulse 90, full; pupils contracted. Had two fits, one 12, the other 36 hours before death. No urine for 4 days after attack, when ℥vj were drawn off.	Death, 138 hours after attack.
8	31	Venereal sores.	Robust.	Ordinary.	Symptoms severe; great collapse; at the end of 18 hours, slight and transient reaction; flocculi in the stools brownish; at the end of 34 hours, stools scanty, consisting of a thick red fluid.	Death, 45 hours after attack.

No.	Age.	Disease when attacked.	Condition as to force when attacked.	Diet when attacked	Circumstances of the Cases.	Result.
9	15	Diarrhœa.	Very thin & delicate.	Milk.	Soon fell into a state of collapse, in which he lingered till the time of his death.	Death, 45 hours after attack.
10	48	Lacer^{d} wound of the hand.	Good.	Ordinary.	Dejections choleric; no vomiting or cramps; collapse slight; reaction early.	Recovery; convalescence rapid.
11	18	Gonorrhœa; rigors, followed by diarr. and fever 3 days bef. attack.	Good before accession of fever.	.....	Vomiting and purging, without cramps; evacuations choleric; collapse slight, and of short duration; afterwards, aspect typhoid; tongue, dry and brown; teeth, sordid; skin, hot and dry; occasional delirium; pulse 120.	Death, 8 days after attack.
12	17	Burn.	Good.	Ordinary.	Great collapse; reaction at the end of 14 hours.	Recov.; conv. rapid.
13	19	Venereal sores.	Good.	Ordinary.	Great collapse; cramps severe; reaction after 22 hours; after 24 hours, evacuations brownish from dark flocculi, scanty at the end of 36 hours; evacuations bilious.	Recovery.
14	20	Ague, dysentery	Very feeble.	Milk, arr.rt.	Fell very rapidly into collapse.	Death, 8 hrs. aft. att.
15	32	Chronic rheumatism.	No visceral disease.	Milk.	Previous constipation—attack sudden; urine not entirely suppressed; other symptoms severe; reaction at the end of 36 hours.	Recovery; convalescence uninterrupted.
16	58	Convalesc^{t} from jaund. with diarr.	Feeble.	Ordinary.	Urine not quite suppressed; did not rally from the stage of collapse.	Death, 24 hours after attack.
17	20	Diarrhœa.	Good.	Milk.	Symptoms extremely violent; cramps excessively severe; great jactitation; rapid collapse.	Death, 7 hours after attack.
18	19	Ague.	Feeble.	Milk and arrowroot.	Previous diarrhœa for two or three days; no vomiting or cramps; dejections very frequent, and choleric for some hours; slight collapse; afterwards diarrhœa for some days.	Recovery.
19	45	None.	Robust.	.....	Previous diarrhœa for 36 hours; cramps severe; complete suppression of urine; other symptoms mild; slight collapse; occasional bilious vomiting, and diarrhœa, with loss of appetite for several months.	Recovery.
20	18	Swelled testicle.	Good.	Ordinary.	Attack sudden; collapse moderate; reaction at end of 20 hours; afterwards occasional diarrhœa and bilious vomiting, for a fortnight.	Recovery.

TABULAR VIEW OF THE DECKS.



A A, B B, the gangways: C C C, the main hatchway, the only entrance into the hold from the orlop deck: D D, two cabins for female nurses.

The short lines represent the fourfold row of beds in the several decks; those to which numerals are affixed, the beds in which the cases respectively occurred.

The beds on the starboard side of the orlop deck were unoccupied during the prevalence of cholera.

ON

ANEURISMS OF THE HEART;

WITH CASES.

BY JOHN THURNAM.

READ JANUARY 23D AND FEBRUARY 13TH, 1838.

PARTIAL dilatation or aneurism of the heart, in the proper application of the term, is a disease the existence of which has been known to physicians and pathologists since the publication of the cases of Walter, Baillie, and Corvisart; but which attracted very little of their attention until 1827, when the occurrence of several cases nearly simultaneously at Paris, lead to the publication of an important memoir on the subject by M. Breschet*. In this memoir, the author gives the history of ten cases, from which he attempts to deduce conclusions as to the nature, causes, and symptoms of the disease; admitting, however, the insufficiency of the facts with which he was acquainted for affording a perfect history of the affection. Since the publication of M. Breschet's memoir, some further researches, chiefly as respects the pathological anatomy, have been instituted, and several cases have, from time to time, been published. The additional facts and observations which have thus accumulated,

* Répert. Gén: d'Anat., &c. Tom. III. p. 181.

are in several respects calculated to invalidate some of the conclusions arrived at by M. Breschet, and would appear capable of furnishing, at the least, some new inferences.

My attention was first strongly directed to this disease, by the occurrence of a remarkable case of it in the Westminster Hospital, which will be the first narrated in this paper. I have since visited the different museums of this metropolis, and that at Fort Pitt, Chatham, and have thus had an opportunity of inspecting, at the least, twenty-five specimens of the lesion in a more or less advanced stage. Of these cases, I found that the greater proportion had not been published at all, and that many of the remainder had only been very imperfectly described in catalogues. Of the appearances of the disease in all these cases I have taken notes, and have endeavoured to obtain as much information respecting their history as possible; and in some instances, have succeeded in obtaining tolerably complete cases, which have been very obligingly confided to my disposal. The new cases with which I have in this way become acquainted are thirteen in number, and of these, eight I have detailed at length; of the others, the accounts are too defective for this purpose, but such particulars as I have been able to collect respecting them, as well as of others before described, I have availed myself of, and have arranged in an appendix to this paper, which contains every case of the affection with which I am acquainted. The materials thus collected are very considerable, amounting altogether to 84 cases, of which 58 are in the left ven-

tricle. With such a number of facts before us, I cannot but conclude that a history of this disease may be formed, more complete than any we have hitherto possessed.

The almost endless discussions, which have so long existed, as to the nature of arterial aneurisms have, to a certain extent, found a parallel in those which have arisen respecting the same lesion in the heart; even during the comparatively short period that pathologists have been aware of its occurrence in this situation. As in the case of aneurism of the arteries, so also in that of the heart, the views of some pathologists who have treated of the disease have been too limited, in contending, as they frequently have, for its production only in one mode. By some, *all* these cases have been considered as so many instances of false aneurism of the heart, produced by rupture or ulceration of one or more of its coats; whilst others have chiefly advocated the doctrine of true aneurism, or that by dilatation. In the course of this paper I believe that I shall be able to adduce evidence to the erroneous character of these exclusive views, and in favour of the position that we ought to admit the existence of both these primary forms of aneurism of the heart, as well as of several varieties of these produced in distinct ways.

Aneurisms of the heart have, as already stated, been met with most frequently in the left ventricle; but there are some undoubted cases of its occurrence in the left auricle; and the valves of the heart have themselves been found, in a few rare instances, to be the seat of dilatations, which may, with propriety, be re-

garded as aneurismal. I intend to consider the disease as it is met with in these three situations.

ANEURISM OF THE VENTRICLES OF THE HEART.

It is a striking circumstance that, so far as we are at present aware, the right ventricle is altogether exempt from this lesion. This fact was, by M. Breschet, adduced as confirmatory of the view which he has taken of the mechanism of its production; and he supposes that the right ventricle is not subject to aneurism, in consequence of its apex being, relatively to the thickness of its lateral walls, much stronger than that of the left ventricle, and consequently better able to support an equal degree of distending force. M. Cruveilhier, also, entertains similar views. It appears to me, that the non-occurrence of aneurism in the walls of the right ventricle cannot be satisfactorily explained in this way; but that, so far as physical circumstances are concerned, it must be attributed to the difference in the function of the tricuspid and mitral valves; the former, in the normal state, permitting considerable, the latter little or no regurgitation of blood. This less perfect closure of the auriculo-ventricular opening on the right, than on the left side, has long been admitted by physiologists, but has been lately more fully insisted upon and demonstrated by Mr. T. W. King. This gentleman attributes what he has called a "safety-valve function" to the tricuspid; and concludes from his researches that its closure is the less complete in proportion "to the increasing degrees of the ventri-

cular distention"*. Admitting the existence of this regurgitation, as permitted by the tricuspid valve, it will readily be seen that the walls of the right ventricle must be much less subject to active distention during the ventricular systole, than those of the left, a difference which, of itself, would appear to me adequate to account for the immunity from aneurism which the right ventricle seems to possess.

But there are other considerations irrespective of the mere mechanism and physical conditions of the parts concerned, and connected with their functions and vital properties, which would lead us altogether to deny the name of aneurism to any form of dilatation that may be met with in the right cavities of the heart. The *right* heart, to adopt the language of some comparative anatomists, is, we must recollect, in man and the warm-blooded vertebrata, the centre of the circulating system of black blood; the centre in fact of the *venous* system; just as the *left* heart is the centre of the *arterial* system. It is well known that the diseases of the arteries have a character different from those of the veins; a circumstance which is probably dependent not merely upon a diversity in the structure of their coats, but also upon a difference in the vital endowments of the two kinds of blood which they contain. We hence find that, by common consent, the term aneurism has been restricted to dilatations of the arteries, whilst varix is that which has been given to a corresponding

* Guy's Hospital Reports, Vol. II. p. 104.

lesion occurring in veins; and, as a remarkable fact, I may observe, in passing, that there does not appear to be on record a single authentic case of lateral or sacculated aneurism of the pulmonary artery, a vessel which, properly speaking, and as regards function, is a vein *. It appears to me that, to consider the subject philosophically, the same distinction ought, at the least, to a certain extent, to be drawn between the partial dilatations of the right and left hearts, as between those of the two systems of vessels to which they are respectively the centres; and this view would certainly appear to be supported by observation, as far as that has already been carried.

Should the propriety of this distinction be conceded, I think it may not be without its use to attempt a definition of aneurism, founded upon it. By the term *aneurism* then, as employed in this paper, I understand, *an abnormal dilatation of a portion of the vascular system of red blood, either dependent upon, or necessarily connected with a morbid change in the tissues forming the walls of the dilated part.* This definition will of course exclude not only all forms of dilatation of the right cavities of the heart and of the pulmonary artery, but also all general dilatations of the left cavities of the heart; different forms of which, either combined or uncombined with hypertrophy, have since the days of Baillou and Lancisi been generally known under the name of aneurism. The inapplicability, however, of

* See a Paper by the Author in the Edinburgh Medical and Surgical Journal. Vol. XLIV. p. 75. 1835.

this term, as applied to these lesions, has not been unperceived by authors; and especially by Morgagni, Corvisart, and Andral; but nevertheless they have all of them by their example sanctioned its employment.

I cannot at all agree with M. Bouillaud in the opinion that these objections are ill founded, nor believe that there is not "any essential difference" between the simple dilatations of the heart and arterial aneurism*. This author has indeed endeavoured to trace an analogy between the general dilatation of one of the cavities of the heart, and the fusiform or diffused true aneurism of an artery, such as is so often met with, involving the whole circumference of the aorta†. Between the two lesions there appears to be this important distinction, that in the dilated aorta, the tunics are uniformly diseased, whilst in the simply dilated ventricle, the tissues are healthy, or at the least not necessarily altered. When the dilatation is accompanied by hypertrophy, the enlargement must frequently be regarded as altogether physiological; or as a change which enables the heart to overcome, at all events for a time, various obstacles in the course of the circulation. On the whole, then, simple dilatation of the heart appears to me to be a change, in virtue of which this organ accommodates itself to the reception of an increased quantity of the circulating fluid, and as analogous not to the aneu-

* Traité Clinique des Maladies du Cœur. 1835. Tom. II. p. 524.

† Dict. de Méd. et Chir. Prat. 1829. Tom. II. Article "Anévrisme."

rismal dilatation of the arteries, but to that physiological, spontaneous, and uniform enlargement, of which they are not unfrequently the seat; as may be seen in the arteries of the uterus during gestation; in those supplying parts which are the seat of hypertrophy or of tumours; and especially in the anastomosing branches of arteries, by means of which a collateral circulation is established after the main artery of an extremity has been tied, or even when the aorta itself has, from disease, been nearly obliterated. When it shall have been further shown, that almost every form of aneurism which has been met with in the arteries, is occasionally found in the heart itself, I think we shall be fully justified in concluding that simple dilatation ought to be considered as a lesion distinct from aneurism, and as having other analogies.

I shall now proceed to the consideration of the disease as it occurs in the left ventricle; which is not only its more frequent but also its more important situation. In the first place, I shall narrate some interesting cases not before published, which I trust will in some degree add to our knowledge of its pathology, if not also to that of its symptoms and diagnosis.

CASE I.

Three Aneurisms of the left ventricle of the heart, consecutive to Rheumatic Pericarditis.

George Mills, aged 28, a tall, well made man, but evidently much reduced by disease, by trade an up-

holsterer, was admitted into the Westminster Hospital, December 13th, 1836. I found him in the ward, sitting upon the edge of his bed, breathing very laboriously, and supporting his head upon the back of a chair. His face bloated, lips livid, features contracted and expressive of the greatest anxiety.

He complained solely of the extreme difficulty of breathing, and of severe pain under the lowest part of the sternum, extending backwards to the spine. The pulse, not distinguishable at the wrist, 108 in the brachial arteries, very feeble and thready; inspirations 40 in the minute; tongue covered in the centre with a thin white fur, livid at the margins; loss of appetite; extreme thirst; nausea and sometimes vomiting. The urine passed freely; considerable œdema of the legs and feet, also of the cheek when in the recumbent posture; surface generally, and the feet particularly, very cold.

Physical signs.—Resonance, upon percussion over the chest generally, pretty good; but the cardiac region not carefully examined in this way. The place of the normal respiratory murmur supplanted by a combination of sonorous and mucous wheezes; the former prevailing anteriorly and superiorly; the latter posteriorly and inferiorly. Motion and impulse of the heart felt over the whole front of the chest; rhythm disturbed; sounds indistinct, with a slight bellows-murmur to the left of the sternum.

He stated that he had uniformly experienced good health, until about eighteen months ago, when he fell off the top of a coach, and "strained himself inwardly."

He also suffered, at the same time, from acute rheumatism, chiefly of the right knee joint; and which, according to his brother, was accompanied by pain in the chest. He became a patient in this hospital under the care of Dr. Roe, July 8th, 1835, and was discharged "cured," according to the hospital register, on the 28th of the same month. Since this illness he has never been quite well, gradually declining in strength and vigour; though not until within the last three months, to the extent of preventing him following his usual employment. About this time he was rather suddenly seized with pain in the chest and difficult breathing, which have gradually increased, and have for some time been combined with anasarca.

He has applied, at different times, to two or three practitioners, by whom bleeding, leeches, and blisters have been prescribed, but with very slight relief; he lost about 24 ounces of blood two weeks since. He has been in the practice of taking a considerable quantity of fermented liquor daily; but his habits have been what are generally called temperate.

Diagnosis and treatment.—Dilatation and hypertrophy of the heart, possibly with constriction of the mitral orifice, the effects of an antecedent, acute endo-pericarditis. To take an ounce of the julep of ammonia (Pharm. Guy.) every second hour; to drink freely of a warm solution of bitartrate of potass, containing a moderate quantity of gin; and beef-tea diet.

December 14th. The same as yesterday. Dr. Burne saw him in the course of the day, and examined his chest, and was satisfied of the existence of

a rather feeble bellows murmur. He directed the remedies to be continued, and an ether draught to be given at bedtime. Towards evening, the patient, for the first time, obtained a little relief from the dreadful difficulty of breathing, and seemed to rally a little, but still the sitting posture was the only one supportable.

December 15th, 3 A. M. I was suddenly called to him. Whilst talking to his wife, the dyspnœa had all at once increased, and falling backwards he had expired.

Dissection, twelve hours after death. *Thorax.*—Upon elevating the sternum, the heart was seen to be of immense size, occupying the entire centre of the thoracic cavity, and encroaching very much on the lungs. The pleuræ on both sides were free from marks of disease; except that the portions covering the concave surfaces of the lungs inferiorly, were, on both sides, adherent, either by strong bridles of membrane, or by a lax cellular tissue, to the opposed surfaces covering the pericardium. The lungs did not present any organic alteration of tissue; but were very considerably affected by venous congestion, and œdematous infiltration.

Heart.—The opposed surfaces of the pericardium were almost universally coherent through the medium of a spongy cellular tissue, which, in some places, was infiltrated with serum.

All the cavities of the heart, but especially those of the right side and the left auricle, were consider-

ably dilated; but the walls of these three cavities were scarcely thicker than in health: the hypertrophy here being chiefly by increased extent. There was very considerable eccentric hypertrophy of the left ventricle; its cavity being capable of containing a large orange, whilst its walls, at their thickest parts, exclusive of the adherent pericardium, measured a full inch. Near the base of this ventricle, the muscular substance had, in two or three places, become replaced by a dense fibro-cartilaginous tissue, which connected the pericardium and endocardium to each other. With the exception of slight gelatinous thickening of the free border of the tricuspid valve, the lining membrane and valves of the right side of the heart were healthy. The sigmoid valves of the aorta, as well as the arch of that vessel, were free from disease. The mitral valve was thickened cartilaginously at its free border; but it was not shortened, and it appeared capable of closing the enlarged auriculo-ventricular opening. The endocardium of the left auricle had an opaque and yellowish appearance; and a very delicate pellicle was capable of being scraped, or rather peeled from its surface, leaving a denser and whiter stratum beneath.

Before cutting into the heart, it had been noticed that, in addition to its prodigious size, it had a very irregular shape; the left ventricle being, as it were, lobulated. This was found to depend upon the presence of three aneurismal dilatations of the walls of this ventricle, which were partially filled with layers

of fibrine, such as are usually met with in arterial aneurisms. The first of these examined was seated in the posterior part of the side of the ventricle near its base; and behind the tendinous cords of the mitral valve, by which its opening into the ventricle was covered. It was about the size and shape of half a lemon cut transversely, and was only slightly constricted at its mouth. In the wall of the ventricle just below this, a second aneurism existed, which, however, was not larger than a good-sized filbert. A third, which was by much the largest; and which appeared to have been formed by the union of two dilatations originally distinct, communicated with the ventricle by a large elliptical opening seated in its anterior wall; and it was this which formed the most prominent tumour externally, rising up beneath the origins of the great vessels. It was biloculate, and each cavity was about the size of an egg or small orange.

Upon removing all the fibrinous layers from the two larger aneurismal sacs, they were found to be constituted almost solely of the pericardium, none of the muscular fibres of the ventricle traversing them. The lining membrane of the ventricle, at the margins of the openings of the two larger sacs, had become converted into dense fibro-cartilaginous rings, which were continuous with a rugose kind of tissue lining the sacs, but not apparently separable as a distinct membrane. The small aneurism differed from the two others in being imbedded in the muscular sub-

stance of the heart, and also in being very distinctly lined by the internal membrane of the ventricle, tolerably smooth and unaltered.

The portions of the ventricle which have been described as having undergone the fibro-cartilaginous degeneration were in the immediate vicinity of the aneurisms. The heart, when emptied of its blood, weighed 32 ounces troy.

Abdomen.—The liver was slightly mottled and granular. The kidneys somewhat enlarged, their cortical portions of a pale livid hue. The rest of the abdominal and pelvic viscera healthy.

The nervous system was not examined.

This case is one of great interest in several respects. In the first place, the lesion was of unusually great extent, there being three, and, as it would appear, originally four aneurismal sacs.

The anatomical characters of the smaller aneurism in this case appear to me strongly to support the view, that lateral aneurism of the heart originates, frequently, in the dilatation of all the coats of that organ. We have here also, I think, an example of this disease consequent upon rheumatic pericarditis. The history points directly to the existence of this affection, and the universal adhesion of the pericardium found after death sufficiently attests it. The inflammation had evidently extended to the muscular substance of the heart, and had produced the fibro-cartilaginous deposit, an anatomical condition which differs from, and must not be confounded with, the

fibro-cellular degeneration of muscular tissue consequent upon pressure and other causes, and which is alluded to by M. Cruveilhier as a cause of partial dilatation. The walls of the ventricle thus altered by the consequences of the inflammation which had probably likewise implicated the lining membrane, would be obviously less capable of sustaining the force of the blood under the influence of the ventricular systole, and might readily become dilated in their weakest points. In the great majority of cases of aneurism of the heart, the adhesion of the pericardium is limited to the surface of the sac, and is doubtless a secondary lesion, attributable to the pressure of the tumour on the opposed surface of this membrane. In this case, however, I believe that the sequence of morbid phenomena was reversed, and that the affection of the pericardium was the primary lesion. It may perhaps be thought that the formation of the aneurisms was due not to the rheumatic affection, but to the "inward sprain," which might have been attended by an imperfect rupture of the muscular fibres of the heart. The fact, however, of there having been four aneurisms, and the smallest of these being evidently lined by the endocardium, would appear to me sufficient to refute such a supposition. With the exception perhaps of Dr. Elliotson's case (27*), this is the only one I am acquainted with, which shews the direct connexion between rheumatic pericarditis and lateral aneurism of the heart.

* The references throughout this division of the paper, are made to Appendix A.

With respect to the symptoms, it need scarcely be observed, that they sufficiently announced far advanced disease of the heart, with obstruction to the pulmonary circulation. The existence of the bellows murmur led me to infer the presence of valvular disease, in addition to hypertrophy and dilatation of the cavities. But the valves appeared to be adequate to the performance of their functions, and I presume that the bellows sound must be referred to the passage of the blood through the mouths of the imperfectly filled aneurismal sacs.

CASE II.

Immense Aneurism of the Apex of the Left Ventricle of the Heart. Sudden Death.

For the particulars of this case, I am indebted to the kindness of Mr. Kiernan, who possesses the preparation, and of Mr. Percival of Earl Soham, Suffolk, who made the examination of the body, about the year 1830.

—— Tatham, aged about 23, a pot-boy, fell down dead suddenly in a street in the eastern end of the metropolis. He had been a patient in the London Hospital, and bore evident marks of active treatment, from cupping, leeches, and blisters over the chest; but beyond this, nothing could be learned respecting his history.

Dissection.—An immense aneurismal tumour was met with growing from the apex of the heart, in a continuation of the longitudinal axis of which it was situated. Between the aneurism and the heart, there

existed a rather deep constriction, which gave the diseased organ an hourglass-like appearance, before it was laid open. The sac, which was as large as the heart itself, and had even a greater circumference, opened into the left ventricle of the heart at its apex; and was formed almost exclusively of the two layers of the pericardium which were strongly adherent in this situation, but which were free through the rest of their extent. Around its mouth, which was about two inches in diameter, and was not furnished with any projecting lip, the lining membrane of the ventricle was somewhat opaque and thickened; and, accompanied by a thin substratum of muscular fibres, appeared to be traceable for about an inch into the interior of the sac, with the rugose interior of which it became almost insensibly blended. The sac was filled with the densely laminated fibrinous coagula peculiar to aneurisms. In other respects the heart was healthy. Mr. Percival is also pretty sure that there was fluid to some amount in the chest, and that there was great engorgement of the lungs*.

From the advanced condition of the lesion it is not very easy, from an examination of the specimen, to come to a satisfactory conclusion as to its mode of origin in this case; so far, however, as the appearances go, they appear to favour the idea of its having been originally a true aneurism, or one by dilatation.

* Mr. Wardrop has had a plate engraved of this beautiful pathological specimen, which he intends giving in his work, on diseases of the heart, now in progress of publication.

It is much to be regretted, that no complete history of the case can be obtained, for one would suppose that its existence could hardly fail to have been announced by remarkable signs, both rational and physical, and that it could scarcely have escaped detection during life, had a tolerably careful manual and auscultatory examination been made. That serious symptoms had existed is sufficiently evident from the numerous marks of cupping, &c., found on the chest after death. From the situation of the tumour, depressing as it must have done the diaphragm, it would appear probable that, from its bulk alone, it would have interfered directly and materially with the functions of that muscle; and probably also with those of the digestive organs.

The following case occurred in the practice of Mr. Langstaff, to whose courtesy I am indebted for the opportunity of communicating it to the Society.

CASE III.

True Aneurism of the base of the left Ventricle of the Heart. General Dropsy; Diseased Liver and Spleen.

Hannah Davis, aged 52, the mother of six children, was admitted into the Cripplegate Workhouse, December 22d, 1817.

Upon examination, it was found that she was suffering from ascites, with anasarca both of the upper and lower extremities, and of the face; that the breathing was performed with the greatest difficulty; the face suffused; pulse 120, very small, but regu-

lar; urine small in quantity, high coloured, and voided with pain.

It appeared that she had been long addicted to dram-drinking; that her health had been declining during two years; and that the dropsical symptoms, which had appeared about twelve months ago, had since that time gradually gone on increasing. She had twice been an in-patient at St. Bartholomew's Hospital during that period.

The evidence of organic disease, of an incurable kind, being so very obviously denoted by the symptoms, and there being every probability of her not living many days, the operation of paracentesis was not proposed. The difficulty of breathing became almost hourly more distressing until December 24th, when she died.

Dissection.—Abdomen.—There were nineteen pints of yellow serum in the peritoneal cavity. The liver was greatly enlarged, granulated, and easily torn; its blood-vessels were also surprisingly congested. The spleen was double its ordinary size, and its capsule was partly cartilaginous and osseous.

Thorax.—There were firm adhesions of the right pleura anteriorly, and about two pints of fluid in that cavity. The lungs on both sides were loaded with blood and water, and retained the impressions of the fingers. There were nearly four ounces of watery fluid in the pericardium. The valvular apparatus of the heart was quite healthy; and with the exception of a thickened state of the appendage of the right

auricle, and a somewhat dilated condition of the left ventricle, this organ appeared quite free from disease, until by chance the fleshy columns of the mitral valve were divided, which led to the discovery of a real aneurism of the ventricle.

The aneurism was evidently one by dilatation, its cavity would have contained a moderately sized Orleans plum; it was situated at the posterior part of the base of the ventricle, behind the posterior and left lamina of the mitral valve. The mouth of the sac measured about an inch in its longest diameter, and was without any projecting lip or rim; in its immediate neighbourhood, the lining membrane of the heart was opaque and whitish, and was most distinctly traceable into the sac, which it lined throughout, its opaque and thickened condition being still more obvious in the centre. There was not the least sign of the fibrin of the blood having become deposited upon it. The sac did not project so as to form any aneurismal tumour on the external surface of the heart, but upon dissecting off the reflected layer of the pericardium, this membrane was found to be in close apposition with a large portion of its more convex part, which was not traversed by any muscular fibres, and had a continuation of the trunk of the left coronary artery passing over it.

The aorta was thickened, and partly changed into cartilage.

The aneurism in this case had evidently been produced by dilatation, and would appear to have origin-

ated in the diseased condition of the lining membrane, exemplifying the mode of production which has been contended for by Reynaud, Ollivier, (d'Angers*,) and Carswell. A preparation in the museum of St. Bartholomew's Hospital (30) bears considerable resemblance to this, and both of them may be said to be instances of aneurisma herniosum. The patient can hardly be regarded as having died of the aneurism; the fatal dropsy evidently being dependent upon organic changes in both the abdominal and thoracic viscera.

For the following case I am indebted to the kindness of Dr. Macreight; and also to that of Mr. Alexander Shaw, in whose collection the preparation is deposited.

CASE IV.

Diffused True Aneurism of the lower half of the left ventricle of the heart, with extensive ossification of the atrophied muscular tissue.

Charles Lidcke, aged 75, a tailor, a patient of the Marylebone Dispensary, under the care of Dr. Macreight. In early life he was of intemperate habits, but enjoyed general good health.

During the last three years, he has suffered from difficulty of breathing and palpitation, with pain and a sense of weight in the region of the heart, which were much increased by the least exercise. The dyspnœa became so severe, that during the last

* Dict. de Méd. 2me ed., Tom. VIII. 1834, p. 303.

month he required to be propped up in bed in the sitting posture, with the chest inclined forwards. The pulse was extremely weak, but he could not bear any stimulant remedies, from their causing increased pain in the region of the heart. Anasarca occurred a few days before death.

Dissection, (by Mr. Graham, January 6th, 1836.) —*Thorax*.—The mucous membrane of the trachea and bronchi presented traces of slight vascular congestion. The cartilages of the trachea were harder than usual. The lungs were free from disease. The pericardium contained about half a pint of fluid. The heart was large, and had white opaque lines on its surface, caused by ossification of the branches of the coronary arteries. On the right side of the heart, no deviations from healthy structure were met with, excepting a few osseous specks in the right auricle. The mitral valve, with its tendinous chords, was a good deal thickened, and the former was studded with osseous points and spiculæ. The upper part of the walls of the left ventricle was hypertrophied, but its lower portion was very much thinned and dilated. The dilated part would contain a small orange, its walls were thinnest at the lowest part, where they did not much exceed two lines in thickness, whilst nearer the middle of the ventricle they had a thickness of from four to five lines, and above this they gradually became continuous with the hypertrophied, but otherwise healthy muscular tissue of the base of the ventricle. The aneurismal portion of the ventricle presented only slight traces of muscular fibres, their

place having become occupied by a whitish cellulo-fibrous tissue; the alteration being most advanced at the lowest part of the dilated ventricle. This cellulo-fibrous tissue was the seat of a very considerable osseous deposit; a large, bony plate having been formed, which externally dipped down into the atrophied muscular tissue, and internally presented a rough surface, covered by the lining membrane of the ventricle. Scarcely any traces of the natural fleshy network remained in the dilated portion of the ventricle; the endocardium lining it was entire, but in many places white and opaque. There was no coagulum attached to its surface. The sesamoid bodies of the aortic valves were large and ossified, as was likewise the arch of the aorta and the large vessels given off from it.

Abdomen.—The liver was paler than in health, and resembled that of drunkards. The other abdominal viscera were healthy.

With respect to the nature of the aneurism in this case, it cannot, I think, be doubted that it had its origin in dilatation, which, however, was remarkable from extending over so large a portion of the ventricle. The case may correctly enough be regarded as one of "diffused true aneurism," and as analogous to the dilatation of the whole circumference of an artery. In the extensive ossification of the atrophied and transformed muscular tissue, we have a very interesting feature, which has no parallel in any of the other cases which I have collected. I cannot help suspecting that some of those rare cases

of ossification of the muscular substance of the heart which we find on record, have been attended by this form of aneurismal dilatation.

The extremely weak pulse, and the general type of the symptoms were such as are reconcileable with the very defective contraction of the left ventricle, which must have existed in connexion with such a condition in the centre of the circulating system. The dropsy, also, which occurred shortly before death, was no doubt principally dependent upon this increasingly defective action of the heart. The peculiar modification of pain which was experienced in the præcordial region, or that of an oppressive sense of weight, is a symptom which I incline to believe will be found one of the more constant of those which belong to aneurism of the heart in its more advanced forms.

Aneurism of the heart was known to John Hunter at a period very long anterior to the publication of the first British case of the disease by Dr. Baillie in 1793. For the knowledge of this fact I am indebted to the Board of Curators of the Royal College of Surgeons, by whose permission, and with the kind assistance of Mr. Clift, I have extracted the following unpublished notes of cases from the Hunterian MSS.

CASE V.

Aneurism of the apex of the left ventricle of the Heart. Sudden death from simple Apoplexy.

General Herbert died suddenly whilst sitting in his chair, April 1757. He was of a full habit of

body, and had suffered from bad health two years before his death, but had been relieved by bleeding from the nose. He had also been dropsical, and used to complain of a heaviness at the heart; the pulse had been tolerably regular. The dropsical symptoms had subsided before his death. He had never suffered from any symptoms like those of gall-stones.

Dissection.—Upon opening the head, the blood-vessels, both arteries and veins, were found very turgid with blood, and nearly a quart escaped from them during the examination. The lateral ventricles were very large and full of water.

Upon opening the pericardium, the apex of the heart was found adherent to it; and upon cutting into the left ventricle, it was found white and callous, and had evidently lost its contractile power. At the apex it was very thin, and had formed into a kind of aneurism, which was lined by a thrombus of its own shape.

The gall-bladder was very large and full of bile, owing to the presence of a large calculus in the commencement of its duct*.

No preparation taken from this case appears to exist in the museum; and the only specimen published in the catalogue, as of this description, is one which exhibits two aneurisms of the base of the left ventricle, the one the size of an orange, the other that of a large nut. Of this preparation (28), which is a very

* Compiled from Hunterian MS. "Account of Dissections of Morbid Bodies." Vol. III. No. 32, p. 20.

good specimen of the disease, I am sorry to say that I have been unable to find any notes remaining in the Hunterian MSS.

There is, however, a series of preparations arranged in the catalogue under the head of "tumours analogous to aneurism," two of which at least are valuable as illustrating one mode of the early formation of these aneurismal dilatations, and one which I believe I am the first to notice. In No. 360*, we have a portion of a heart described in the catalogue as shewing "an appearance similar to tumour on the inside of the right ventricle. It is composed of a succession of laminæ of coagulated lymph, that seem to be dissolved in the centre into a kind of glairy mucus, which gives it a cavity." No. 361 is "a portion of the apex of a heart, shewing a similar formation in both ventricles." These tumours appear to correspond accurately with the description which Laennec gives of his "globular excrescence of the internal walls of the heart," † and which have also been well described by Andral in his excellent chapter "on the lesions of the blood contained in the cavities of the heart." ‡ In the Hunterian MSS. this form of coagulum is generally spoken of, after the older authors, under the name of "Thrombus."

* Catalogue of Hunterian Collection. Path. Prep. in Spirit. 1830. p. 32.

† De l'Auscultation, &c., by Forbes. 4th Ed. 1834. p. 616.

‡ Path. Anatomy, by Townsend and West. Vol. II. p. 355. See also Bouillaud Traité Clinique, &c. T. II. p. 179. He calls them "fibrinous vegetations."

In the first of these cases, No. 360, the walls of the ventricle (the right) appear perfectly healthy, and this is also the case in the right ventricle of the second preparation, No. 361; but in the latter the apex of the left ventricle, which is the seat of the largest of these tumours, is plainly thinned and hollowed out around it, so as to form an incipient aneurism; which, however, is not sufficiently advanced to produce any external projection or tumour. The substance of the ventricle, however, in this situation, is of a pale colour, and is evidently the seat of fibrous degeneration. The preparation corresponds so accurately with the description in the following case, that I have no hesitation in referring them to each other.

CASE VI.

Incipient true aneurism of the apex of the left ventricle of the Heart, with hollow globular coagula. Hemorrhagic Pleurisy and Pneumonia. Serous effusion in the Brain.

Dissection of the body of Colonel Graham. The membranes of the brain were loaded with serum, of which there were three or four ounces in the ventricles. Some ossification of the arteries of the pia mater. The substance of the brain was healthy. The pleuræ were adherent over the upper points of the lungs. The left lung was healthy, but a part of the lower lobe of the right lung was dense from its tissue being gorged with water. The posterior part of the pleural cavity of the same side was smeared over with red blood, but without any appearance of ruptured vessels. The substance of the left ventricle of the heart, for about an inch around the apex, was

thinner, more flabby, and of a more livid colour than usual; it was occupied by a firm substance like coagulated blood of long standing, the interior of which was hollow, and filled with half coagulated blood. In many places in the interior of this ventricle were a number of small bodies peeping out from between the fasciculi, and which were of the same nature. The external surface of all of them was smooth, and as if washed clean of the red particles of the blood, by the motion of the circulating fluid through the ventricles. Something of the same kind was found in the right ventricle, which shewed the nature of the disease still better than the left *.

The production of the aneurismal dilatation in this case would appear to admit of the following explanation. The thinnest part of the walls of the ventricle was the seat of a foreign body, by which it must have been compressed during the contractions of the heart; as a consequence of this, atrophy of the muscular fibres ensued, then fibro-cellular degeneration, and lastly, the dilatation of the part; the lining membrane of which was most probably in the beginning quite healthy.

The third and last preparation in this series, No. 362, is described in the catalogue as "shewing a similar formation occupying a large portion of the cavity of the left ventricle." The coagulum, however, would appear to be of a different character from that in the last case.

* Compiled from MS. Cit. Vol. III. No. 156. p. 169. See Plate III. Fig. 2.

The following is the case as compiled from the MS. notes.

CASE VII.

Aneurismal dilatation of the anterior portion of the left ventricle of the Heart. Apoplexy. Softening of the Brain.

Mr. ——, aged 61, died of apoplexy. His death was preceded by vomiting.

Dissection.—A partial softening of the brain was met with, accompanied by a dotted redness of its substance. There was about an ounce and a half of water in the lateral ventricles. Pleuritic adhesions existed on the left side of the chest. Upon cutting into the pericardium I found that it had a glutinous adhesion to the heart on the left side, which was, however, readily separated. The heart appeared to be everywhere sound, except on the fore part of the left ventricle close to the septum, where there was a gentle rising, and a kind of discolouration. Upon exposing the interior of this ventricle, I observed a solid coagulum of blood, of an oval figure, occupying that portion of its cavity corresponding to the external swelling; and this was firmly entangled among the fasciculi of the heart, and was evidently of old standing. Fluctuation was distinguishable beneath this coagulum. I made a section through the external swelling into the coagulum, and found a small cavity occupying partly the wall of the ventricle and partly the substance of the coagulum. This cavity contained a bloody matter. (The muscular substance of the ventricle in the part occupied by the coagulum had

lost its firmness, and was considerably thinner than elsewhere; at the most convex part of the dilatation not measuring more than two lines in thickness. J. T.) The right cavities of the heart contained some of the ordinary coagula. The stomach was very much contracted*.

Hunter concluded, with respect to this case, that the heart, in the situation of the coagulum, "had lost its proper action;" or, as he says elsewhere, "must have become paralytic," to have allowed the blood to coagulate in this place. Subsequently to the formation of the coagulum, he believed that an abscess had formed in the substance of the ventricle, the matter of which had come in contact with the coagulum, had dissolved part of it, and in this way had produced the bloody fluid which was met with in the cavity.

Even admitting that an abscess had really existed in this case, which I think neither the description given by Mr. Hunter, nor a careful examination of the preparation will warrant us in concluding, I should be strongly inclined to assign its production to a period prior to that of the coagulum. I should, however, rather suppose that the bloody fluid spoken of was simply some grumous uncoagulated blood, which had become confined between the coagulum and the wall of the ventricle. The case is very interesting, as confirming the view taken of the mode of production of the dilatation in the preceding case.

A case recorded by Corvisart, (5) in his chapter on polypiform concretions, also appears to illustrate

* MS. Cit. Vol. III. No. 122, p. 128.

this mode of production of an aneurismal dilatation of the walls of the heart*.

In the history of the disease, as it is met with in the left ventricle, which I shall now attempt to give, I shall apply, as rigorously as may be, the numerical method to the fifty-eight cases to which references are given in the Appendix.

Lateral aneurism of the left ventricle is met with under two principal forms. Thus it may be either unattended by any external deformity of the heart, and confined altogether to the ventricular walls; or it may present itself in the form of a tumour growing from the exterior of the organ, and in size varying from that of a nut to that of the heart itself. In sixty-seven aneurisms occurring in the fifty-eight cases, thirty-five were attended by tumour; in nineteen there was no tumour; and in the remaining thirteen, it is doubtful whether tumour existed or not; although, from the small size of the sacs in these latter cases, it is probable that the disease scarcely extended beyond the surface of the ventricle. There can scarcely be a doubt, that in its earlier stages at least, this lesion is far from unfrequent; and it may be observed, that it is in these stages that anatomical examination will be likely to throw light upon the mode of its formation. Sir Astley Cooper has informed me that he has himself met with two or three cases, which I have not included in the Appendix, in which the commencement of the disease existed. The seat of the

* Diseases of Heart, by Hebb, 1812, Case 56, p. 398.

lesion in these instances was the anterior wall of the ventricle, the dilated portion was lined with layers of coagula precisely like those met with in the aneurisms of arteries, the pericardium corresponding to it was thickened, and in some of the cases, Sir Astley thinks was adherent.

The size of the aneurismal sacs varies greatly; thus, in nine cases, their size might be compared to that of nuts; in twenty, to that of walnuts; in seven, to fowls' eggs; in fourteen, to oranges; and in nine cases, (4, 7, 10, 11, 20, 24, 28, 34, 48,) it almost or quite equalled that of the healthy heart itself. In one of these last named cases, that recorded by Mr. Adams, (20,) the tumour had nearly presented externally. When the disease has been of some standing, and the sac has attained to a certain size, it usually opens into the ventricle by a mouth, the diameter of which is narrow, relatively to that of the sac itself; and the lips of which, like those of old arterial aneurisms, are generally projecting, well defined, and formed of a dense fibrous tissue. This kind of opening to the sac was present in at least twenty-five of the cases; whilst, in nineteen others, which were mostly incipient, the mouths were as wide or wider than any other part of the sac, and no such projecting lips existed.

With respect to the tissues of the heart engaged in the formation of the aneurismal sac, a careful analysis of the cases would seem to shew, that in fifteen, the sacs were formed by the muscular fibres and pericardium; in four, (25, 30, 33, 44,) by the endocardium and pericardium only; in twenty-five, by all of

the structures entering into the composition of the walls of the heart; whilst, in twenty-three cases, the disease was either too far advanced, or the data are insufficient to enable us to assign them to their proper places. The aneurismal sacs had in some cases undergone changes and transformations of different kinds; thus in two cases, (32, 37,) they are stated to have assumed a steatomatous structure; in three,(4, 19, 58,) a cartilaginous one; which latter change, in six others, (7, 15, 20, 36, 40, 49,) was combined with a more or less advanced calcareous or osseous degeneration.

In twenty-one cases, and probably in a still greater number, the sac had become strengthened by adhesion to the loose or fibrous layer of the pericardium; and in all these instances, the disease had advanced to the extent of producing tumour on the external surface of the heart. How small an extent of such tumour is capable, by its attrition on the opposed surface of the pericardium, of originating the limited inflammation which terminates in this adhesion, is well shewn by the Hunterian case, which forms the seventh related in this paper, (52,) and also by a preparation in the museum of St. Bartholomew's Hospital (30); in neither of which does the tumour form more than a gentle prominence on the surface of the heart. In a few cases, (2, 33, 55,) this process had not extended beyond the production of opacity and thickening, or that of shaggy false membranes over the surface of the sac.

In six cases, (1, 9, 16, 22, 55, 57,) in none of which had adhesion taken place between the aneurismal portion of the heart and the pericardium, and

in which the aneurism scarcely, if at all, projected beyond the surface of the ventricle, a rupture of the sac had occurred, which had led to a fatal extravasation of blood, into the pericardium. In one case only, related by Sir Astley Cooper, (10,) does rupture appear to have occurred when there was the adhesion alluded to, and in this instance the left pleura was the seat of the hæmorrhage. In another instance, (34,) the tendinous centre of the diaphragm was adherent to the greater part of the sac, which was very large, and had a small supplementary pouch, with very thin walls engrafted upon it; and had this become the seat of a rupture, it must have led to extravasation into the peritoneum.

As regards the contents of the sacs, in twenty-three cases, which were chiefly those furnished with constricted mouths, and which were of considerable size, there was found a greater or less quantity of laminated coagula; seventeen, either apparently of less standing, or situated more in the direct channel of the blood, contained simple amorphous coagula; whilst nineteen appear to have been found empty after death. In three other cases, the contents were, in one, (51,) a hollow globular coagulum; in two others, (5, 52,) simple fibrinous ones, evidently of old date.

It would appear that no part of the left ventricle is exempt from becoming the seat of aneurism. Although a more extended acquaintance with cases than was possessed by M. Breschet at the time when he wrote on this subject, shews that this author was in error when he supposed the disease to be nearly, if not quite confined to the apex of the ventricle, yet

this would still appear to be its *most* frequent situation. Thus the sixty-seven aneurisms which occurred in the fifty-eight cases, omitting one case (21) in which this is not mentioned, may, as regards situation, be thus distributed; at or near the apex of the ventricle, twenty-seven; in different points of the base, twenty-one; in intermediate portions of the lateral walls, fifteen; in the interventricular septum, three. Of the cases in which the sac was seated at the base, four, which occurred to Dr. Hope, (31, 32, 36, 37,) are remarkable from having opened both into the ventricle and into the aorta. Dr. Hope is of opinion that "steatomatous degeneration had caused the formation of a canal from the aorta underneath one of the sigmoid valves and the internal membrane of the left ventricle," and that, in this way, an aneurism had originated, which had ultimately opened into the cavity of the heart. It would, however, appear to me more probable, that the aneurisms had originally been formed in the ventricle, and had subsequently communicated with the aorta, as a consequence of the coexistent disease of the valves of that vessel; and I may observe, that this view would appear to be supported by four other cases (16, 22, 43, 56,) in which the sacs had precisely the same situation, but in which there was no communication with the aorta. In the last of these cases, the preparation of which is in the museum at St. Bartholomew's Hospital, the contiguity of the aneurism to the aorta is such as to have led to its being described in the MS. catalogue as an aneurism of that vessel. Of the three cases (5, 12, 42) in which the aneurism had its seat in the septum of the ventricles, one

is only briefly alluded to by M. Cruveilhier as occupying its lower half, and as threatening to burst into the right ventricle. In another of these cases, recorded by Laennec, an accidental ulcerated canal had been formed in the highest part of the septum, and was accompanied by what would appear to have been a minute aneurism, containing fibrinous coagula. It is well known to anatomists, that the highest part of the septum, which occupies the angle between the posterior and right aortic valves, and which, in some instances of congenital malformation, is deficient, is in the human subject formed not of muscular fibres, but simply of the endocardium of the right and left ventricles almost in apposition, and strengthened only by the interposition of a little fibrous tissue continuous with that of the aorta. In many ruminant animals this point is well secured by an osseous plate; but in man, as a comparatively weak spot, it is perhaps probable that occasionally it may become the seat of aneurismal dilatation. I am not, however, in possession of any fact which proves this to have occurred; unless a case, the preparation of which is in the museum of the Royal College of Surgeons, and which I shall describe when speaking of aneurismal dilatation of the valves of the heart, is to be considered of this nature. To conclude these observations on the situation of aneurism of the left ventricle, the only general conclusion that we can come to appears to be, that the thinnest parts of its walls, or the apex and the highest part of the base, are those which are much more frequently than any others the seat of the disease.

In general, or in fifty-two out of the fifty-eight cases,

only one aneurism existed in each; but in four cases (23, 27, 29, 55) two were met with in each; in one (47) there were three; and in another (45) four incipient aneurisms. In two instances, (25, 47,) it is not improbable that two sacs which were originally distinct had coalesced, so as to form a single aneurism; and in another case, (38,) three sacs appear to have united in this way.

An important point in the history of lateral aneurism of the heart, is that which relates to the other lesions of this organ, which are found to accompany it. To begin with the pericardium: in addition to the twenty cases already alluded to in which there was adhesion to the surface of the aneurismal tumour, we find that, in seven cases, (13, 20, 25, 58, 45, 46, 47,) there was general adhesion of this membrane to the surface of the heart; that in one, (39,) there was recent hæmorrhagic pericarditis; and that in three, (21, 44, 49,) there was dropsy of this cavity. In twelve cases, the endocardium is stated to have undergone different changes of structure; so as to have become either white, opaque, or thickened in the immediate neighbourhood of the sacs, or even more extensively; and in one case, (54,) there was a minute deposit of calcareous matter either in or beneath this membrane. The muscular substance of the ventricle was, in at the least nine cases, the seat of more or less extensive fibro-cellular degeneration, which was generally most marked around the sacs; in one case, (47,) there was a cartilaginous transformation; and in another, (7,) induration from a non-

specified cause. In one instance, (27,) the walls of the ventricles are said to have been the seat of "lardaceous tumours," and in another, (54,) of extensively diffused suppuration. In numerous cases, there was a marked atrophy either of the fleshy columns which form the pillars of the mitral valve, or of the smaller ones which constitute the net-work on the internal surface of the ventricle. The valves of the left cavities are stated to have been diseased in ten cases; in five of these the mitral valve was the seat of the lesion, and was constricted by cartilaginous or osseous deposit; in three, the aortic valves were diseased, and both these sets of valves were implicated in one example. In eight cases, the valves are reported to have been healthy; whilst, in the remainder, their condition is not mentioned.

Respecting the pathological changes in the heart, which we have thus seen to accompany lateral aneurism of that organ, it appears important to observe that they may almost universally be regarded as the effects of inflammation. With respect to a majority of them, or those seated in the muscular tissue and pericardium, there can, on this head, scarcely be a doubt; and although some difference of opinion may still exist respecting the alterations which have been alluded to as involving the endocardium and the valves, yet they are now very generally, and I think correctly, regarded as the consequences of inflammation. From this part of our enquiry also, I think we can scarcely avoid drawing the inference, that aneurism of the heart cannot be regarded as exclusively

dependent upon pathological changes in one only of the tissues entering into the composition of this organ.

There is another class of pathological conditions, which are not unfrequently found to accompany aneurism of the heart, to which it is necessary to allude; more especially as one of them has, by M. Breschet, been regarded as playing an important part in its production. I allude to changes in the thickness of the walls, and in the capacity of the cavities of the heart; and particularly to hypertrophy and dilatation.

In the fifty-seven cases of aneurism, there is reported to have been general dilatation of the organ in three instances; dilatation with hypertrophy of all the cavities in three; dilatation with hypertrophy of the left ventricle in nine; simple dilatation of the left ventricle in four; and simple hypertrophy of the same cavity in two other cases.

The number of cases in which the heart is not stated to have been the subject of some lesion in addition to the aneurism, does not exceed ten; and in three only (17, 48, 52) is it positively stated to have been otherwise healthy.

Before entering into the consideration of the nature of the disease and of its mode of production, it will be desirable to notice what may be ascertained respecting its causes. In the first place, as respects the influence of sex; in forty cases, in which this is recorded, thirty occurred in males, and ten in females. The proportion thus met with in the female, is much greater than is found to be the case

in arterial aneurisms, which, according to Hodgson; occur eight, and according to Lisfranc, eleven times oftener in the male than in the female. Even as respects aneurism of the aorta, the most common variety of the disease in the female, Dr. Hope has only found the proportion to be rather larger than that indicated by Hodgson.

The age of the patient is either stated or to be inferred with tolerable accuracy in thirty-five cases. The youngest patient appears to have been eighteen and the oldest eighty-one years of age; and the whole of the cases may be arranged in decennial periods as follow:—

Under	21 years of age;	1 case.
From 21 to	30	9 cases.
31 ...	40	4 .....
41 ...	50	3 .....
51 ...	60	6 .....
61 ...	70	4 .....
71 ...	80	7 .....
Above	80	1 case.

From this analysis, then, it appears, that after adult age, cardiac aneurism is not remarkably confined to any particular period; although it would seem to prevail with the greatest frequency at two distinct periods, or between the ages of twenty and thirty, and again in very advanced life. In this respect, then, we likewise find that cardiac aneurism differs remarkably from arterial, which, according to the experience of Sir

Astley Cooper, and also from an analysis of 108 cases by M. Bizot*, prevails chiefly between the ages of thirty and fifty.

As regards the occupation and mode of life, out of seventeen cases, all males, in which this is stated, it appears that there were one nobleman, (1,) one merchant, (2,) one tragedian, the celebrated Talma, (17,) two generals, (16, 50,) one colonel, (51,) five private soldiers, (10, 18, 24, 35, 39,) one gondolier, (8,) one cabinet-maker, (47,) two tailors, (31, 49,) and two victuallers. (33, 48.) It is a striking fact, that out of this number, eight, or one half, should have been soldiers; a circumstance which would lead one to suspect that the exposure to which this class of persons is subject, and the forced exercise which they undergo, may have something to do with the production of this lesion.

With respect to the causes, predisposing and exciting, of cardiac aneurism, very little that is satisfactory appears in the cases hitherto published. Under the head of predisposing causes may perhaps be placed intemperate habits, which are mentioned in four cases, (20, 31, 44, 47,) and rheumatic disease of the heart in two cases. (27, 47.) Although not mentioned, it is still highly probable, that, in some at least of the six other cases, in which universal adhesion of the pericardium was met with, rheumatic pericarditis had existed; and there can scarcely be a doubt, that, as of other organic diseases of the heart,

* Mém. de la Soc. Méd. d'Obs. Tom. I. p. 409. Recherches sur le Cœur et le Système Artériel.

so also of aneurism,—acute rheumatism, affecting this organ, either in the form of endocarditis or of pericarditis, is to be regarded as closely connected with the production, if not as the efficient cause, of this lesion.

If this view should prove to be correct, we shall have no difficulty in explaining the greater frequency of cardiac than of arterial aneurism during early life; as it is well known, that in the progress of acute rheumatism, the inflammatory affections of the heart which have been alluded to, occur much oftener at this than at any other period.

The exciting cause of the disease would appear to have been external violence in the form of an injury of the chest in the case of the gondolier, (7,) a fit of violent anger in that of the nobleman, (1,) protracted mental anxiety in another instance, (33,) severe efforts on the stage in the character of Hamlet, in the case of Talma, (17,) and in a fifth instance, (10,) the retention of the breath during a military flogging.

From an examination, then, of the anatomical details, as well as of the apparent causes of the disease, in reference to the determining of its nature, I come to the conclusion, that in twenty-two cases out of the fifty-eight, the aneurism originated in a dilatation of all the structures entering into the composition of the walls of the heart; and in six, (1, 8, 9, 12, 17, 26,) in a solution of continuity of the lining membrane and inner stratum of muscular fibres, either as a consequence of ulceration, or, what is more probable, of rupture; whilst, in the remaining thirty cases, the disease was either too far advanced, or the data given

are insufficient to enable us to form a satisfactory opinion on this question.

I therefore conclude that this lesion, in by far the greater proportion of cases, is of the nature of *true aneurism;* or that it has its origin in the dilatation of a portion of the walls of the heart, which has become less able to resist the distending force of the blood during the ventricular systole, in consequence of organic changes in the tissues composing it. These changes may be confined to one of these tissues, as the endocardium; or they may involve that membrane and the muscular structure simultaneously; or, lastly, they may, I believe, originate in the pericardium, and be propagated from without inwards. In a great majority of instances, these changes would appear to have been the result of a more or less active antecedent inflammation.

I have on one or two occasions noticed an appearance on the internal surface of the left ventricle, which appears to me to have been the earliest stage of those pathological changes which terminate in the formation of true aneurism. This consists in a more or less decided enlargement of one of the natural interspaces or depressions between the smaller fleshy columns. In one case which I have had a recent opportunity of examining, I met with a small cavity in the centre of the interventricular septum, which was capable of containing a small horse-bean. This cavity was evidently an enlargement of one of the natural sulci, which have been alluded to; it was traversed by the lining membrane of the heart, which

in this particular spot was white and opaque, and it was only separated from the cavity of the right ventricle by a very thin stratum of muscular fibres, of a whitish appearance and dense fibrous texture. (See Plate III., fig. 1.)

Granting that the condition which has been now described, would, under certain circumstances, have led to the production of an aneurism of the heart; or, in other words, that it constituted an aneurism in its earliest stage, the observation must be regarded as important, and as fully confirming the view which has been advocated of the more usual mode of formation of true cardiac aneurism.

The cases of biloculate and multiloculate aneurisms, a few of which are on record, (25, 38, 47,) as well as the at first sight anomalous case described and figured by Dr. Elliotson, (27,) in which two distinct aneurisms communicated by a very small opening,—are all, I think, susceptible of explanation, upon the view of aneurisms having originated in the dilatation of two or more adjoining depressions, formed by the interlacement of these muscular bundles.

From two cases reported in this paper, as well as from another published by Corvisart, (5, 51, 52,) it would appear probable, that a lesion of the blood contained in the ventricle, leading to its spontaneous coagulation, is adequate to the production of an aneurismal dilatation; independently of any original morbid condition of the walls of the cavity. (See plate III., fig. 2, and likewise pp. 214, 216).

True aneurism of the heart, with a few rare ex-

ceptions, which will be hereafter alluded to, is analogous to the circumscribed, lateral, or sacciform true aneurism of arteries. In the early stages of this form of aneurism of the heart, the disease may properly be spoken of as *aneurismal dilatation of the heart.*

The occasional occurrence, however, of false aneurism of the heart is, I think, not to be doubted. That partial ruptures of the heart may occur, is sufficiently proved by cases in which such have been observed, in addition to others which have been complete, and have hence occasioned death. Again, the examination of some cases and preparations would lead us to conclude that rupture of the heart, even when ultimately fatal, has not always been of momentary occurrence, but, on the contrary, has taken place very gradually, having commenced in the internal stratum of fibres, and only slowly spread to the external. Thus, in the museum of University College, there are two preparations of ruptured heart, (599 and 600, ix. M. B.,) both from subjects in the dissecting room, and which I have been informed by Mr. Alexander Shaw were taken from the cases which have been referred to by the late Mr. John Shaw, in his "Manual of Anatomy."* The rupture in both of these specimens is extremely small, and in the one is seated at the apex, in the other, midway between the apex and base of the left ventricle; and in both the perforation would appear to have been consequent upon a previous imperfect rupture: for internally there is a destruc-

* Vol. I. p. 120.

tion of the muscular substance, to an extent capable of holding in the one case a nut, and in the other a walnut, around the margins of which the ruptured lining membrane and muscular fibres are very evident. We have only to suppose, that under a favourable combination of circumstances, the extension of the rupture had in these cases not taken place, when we may easily perceive that a false consecutive aneurism would have been produced.

It may also be observed, that this view is further supported by the sudden occurrence of the first symptoms of the disease in a few of the cases, (1, 7, 10, 17,) under circumstances not unlikely to produce rupture of the heart, and of a character almost identical with those attributed to that lesion.

Although I am not at all disposed to deny the possibility of false aneurism of the heart originating in ulceration, and in the discharge of the contents of abscesses and cysts into the cavity of the ventricle; yet I may observe, that I am not satisfied of this having been the mode of production in any case with which I am acquainted.

It is well known that "*external mixed aneurism,*" or the supervention of a false upon a true aneurism, does not occur in the pericardial portion of the aorta, in consequence of the absence of a distensible cellular coat to this portion of the artery, and that hence lateral aneurism in this situation usually proves fatal from rupture at an early period. For the same reason, mixed aneurism does not occur in the heart, but as we have already seen, the aneurismal sac usually soon gains

an adhesion to the pericardium, by which means rupture is, in most cases, prevented.

True aneurism, or that by dilatation, may either involve a limited point only, or the whole circumference of an artery; and in the latter case it constitutes a disease which has been variously named, "preternatural dilatation," "cylindrical or fusiform aneurism," "diffused true aneurism," and "arteriectasy."* I am, I believe, the first to contend for the existence of an analogous form of aneurismal dilatation in the heart; for, as I have observed when speaking particularly of the fourth case in this paper, the lesion in that instance would appear to merit the name of "diffused true aneurism of the heart." Dr. Carswell and M. Cruveilhier have indeed each alluded to a case of extensively diffused true aneurism of the heart, (39, 46,) and the former has given a drawing of the disease, but in neither of these cases had the dilatation involved the entire circumference of the ventricle.

It appears not improper to designate by the name of *dissecting aneurism of the heart*, that form of the disease, in which an aneurism, as in Dr. Hope's cases, (31, 32, 36, 37,) forms a canal under the lining membrane of the ventricle, which opens at some other point. The analogy of these to the rare cases of arterial aneurism, reported by Laennec, Guthrie, and Shekelton, would appear to be sufficiently obvious.

* The "arterial varix" of Dupuytren, or "cirsoid aneurism" of M. Breschet, may properly enough be regarded as a variety of diffused true aneurism.

M. Bouillaud * has drawn a parallel, and I think justly, between the case of M. Reynaud, (23,) in which, as in some others which I have examined, (30, 44,) the sac is formed solely by the endocardium and pericardium, with that rare form of arterial aneurism, described by Haller, Dubois, and Dupuytren, and still more recently by M. Breschet, in which the lining membrane of the vessel protrudes through a rupture in the middle tunic, constituting a lesion, which has been sometimes designated "aneurisma herniosum," and sometimes "internal mixed aneurism."

The hernia-like protrusion of the lining membrane through the muscular substance of the ventricle, in the shape of an aneurismal sac, is particularly well seen in Mr. Langstaff's case, (44,) which has already been particularly described in this paper.

In the case of an aneurism seated in the interventricular septum becoming ruptured, so as to form a communication with a portion of the venous system, —the right ventricle, we should have a lesion produced altogether analogous to that which results from the wound of an artery and its accompanying vein, and to which the name of *spontaneous varicose aneurism of the heart,* is perfectly applicable. We possibly have an instance of such a form of the disease in the case related by Laennec, (12,) and another alluded to by Cruveilhier, (46,) approached very closely to it.

We are then, I think, justified in asserting that,

* Dict. de Méd. et Chir. Prat. Article Aneurism.

we find in the heart, with the exception of "the external mixed aneurism," for the non-occurrence of which there is an anatomical cause, all the varieties of the disease which are met with in the arteries themselves; and that we cannot recognize the simple increase in the capacity of the cavities of this organ as constituting a lesion that ought to be spoken of as aneurism.

In the departments of symptomatology and diagnosis, the information that we possess relative to this form of disease is less extensive and precise than that relative to its pathology. It is probable that, in its incipient forms, aneurism of the heart is not necessarily attended by any derangement in the function of this organ. In two cases, (16, 23,) it is expressly stated that no symptoms referrible to the heart existed during life, and in these the disease was in a very early stage.

The mode of incursion of the disease differs remarkably in two classes of cases. Thus in three instances (1, 10, 17) the attack was sudden, and attended with marked symptoms, analogous to those observed in cases of rupture of the heart, when this is not directly fatal; either in consequence of the rupture being incomplete, or from the opening being so small as to allow only of a very gradual effusion of blood into the pericardium. The most instructive of these cases is that of the nobleman, (1,) related by Galeati; who after a violent fit of anger, was suddenly seized with severe præcordial pain, orthopnœa, agitation, fear of death, a disposition to syncope, and a vibratory, frequent but languid pulse.

In cases of this description, the mode of attack, as well as the immediate causes, would lead us to conclude that the disease is of the nature of false aneurism from rupture.

In the great majority of cases, however, the disease would seem to have had a very insidious origin, and to have been only very gradually announced by symptoms. This is what we should be prepared to expect in cases of true aneurism; and it may be observed that this difference in the mode of attack in the two forms of the disease, corresponds with, and supports the conclusion, which chiefly on anatomical grounds, has been already come to, that true aneurism of the heart is much more common than false.

In five cases, (5, 14, 32, 36, 38,) the symptoms of the disease are described generically as those of "diseased heart." In twenty-three cases in which the symptoms are given in detail, these, taken in the order of their frequency, were as follow; dyspnœa, in several instances amounting to the severest form of orthopnœa, in fifteen cases; præcordial pain of different characters, in one or two cases amounting merely to uneasiness, but in several others accompanied by a sense of weight, in fourteen; dropsy more or less extensive, in ten cases; palpitation in nine cases; anxiety, dread of death, or restlessness, in eight; and syncope, or a disposition to it, in three cases.

In addition to these symptoms others are also more rarely mentioned; such as cough, throbbing of the carotid arteries, pulsation of the jugular veins, livid or blue countenance, and hæmorrhage from the nose

and lungs. The condition of the pulse is noted only in a few of the cases, and in seven of these it is stated to have been feeble, sometimes in an extreme degree.

Of the duration of the symptoms referrible to the heart, I find notices in fourteen cases. In one remarkable case, that of the nobleman, already more than once alluded to, (1,) the patient would not appear to have survived more than ten days after the development of the lesion. In the other cases the length of time occupied by the disease appears to have varied from three or four months (47) to fifteen years (7).

In twenty-four cases, the mode of death is stated. In twelve of these in which it was very sudden, it arose, in three from syncope (7, 26, 48); in one from an unknown cause (21); and in eight from internal hæmorrhage. In six of these eight cases, (1, 9, 16, 22, 55, 57,) the hæmorrhage was dependent upon a rupture of the aneurismal sac into the pericardium; in one, (10,) upon a rupture of the sac into the left pleura; and in another (8) upon a rupture of the substance of the ventricle itself, in the immediate neighbourhood of the sac. In four cases (18, 43, 50, 52) the patients appear to have died from an apoplectic or paralytic affection, and in one (4) from epistaxis. In three cases (33, 34, 47) the mode of death was the more ordinary one in heart affections, or that by apnœa, (asphyxia,) and this, though not positively stated, was probably also the case in six other instances (10, 14, 20, 31, 44, 49). In the following cases,

six in number, (15, 17, 23, 38, 39, 51,) as well as in the four apoplectic cases, death was evidently the result of complication with other diseases.

As aneurism of the heart has seldom been met with, uncomplicated with other lesions of this organ, great difficulty necessarily attends our forming any conclusions as to the general symptoms, if any, which distinguish it. Although, however, the symptoms which have been met with cannot be regarded as pathognomic, yet their rationale does not appear at all obscure. The presence of an aneurismal dilatation of the walls of the heart, attended as that often is by fibrous degeneration and other changes in the tissues forming them, must almost necessarily lead to the imperfect contraction of this muscle, and to the consequent retardation of the blood in its cavities; thus producing symptoms of obstruction in the arrière circulation; dyspnœa, venous congestion, passive hæmorrhages and dropsy. In some cases, however, it is probable that, from the heart retaining a tolerable share of vigour, and from its walls, unaffected by any other morbid change, becoming the seat of a moderate degree of hypertrophy, the disposition to a retardation of the blood may as it were be counterbalanced; and that the development of the symptoms of an obstructed circulation may, for a considerable period, be postponed. On the other hand, these symptoms may be much increased in severity, where there is not this degree of tone in the muscular fibres, by the supervention upon the primary affection of a general dilatation of the ventricle.

But in addition to the class of symptoms now alluded to, a variety of distressing sensations in the præcordial region were experienced in a great proportion of cases; which would, to a certain extent, serve to distinguish the disease from cases of simple dilatation with or without hypertrophy. Symptoms of this description are met with in two well known forms of disease of the heart, angina pectoris and valvular disease, and especially in those cases in which there is much ossification. Now although the group of symptoms which are known by the name of angina pectoris, cannot always be referred to an ossified and indurated condition of the coronary arteries, valves, and origins of the great vessels, yet as the best recent authorities concur in the belief that, in the majority of cases, it is associated with these or similar changes, we shall not perhaps be generalizing too rapidly, in ascribing the uneasy sensations and pain, which are met with in these three forms of disease, to one common cause.

This would appear to me to consist in the irritation occasioned by the rigid and inelastic morbid structures to the cardiac nerves, and especially to those derived from the great pneumogastric,—a nerve which recent experimental researches, and especially those of M. Brachet, as well as anatomical analogy, have shewn to be, to a certain extent, in all probability, a sentient nerve. The character of the pain experienced in aneurism of the heart differs, as we have seen, in different cases, but in some it was described as being accompanied by a peculiar and distressing sense of

weight; a kind of pain more intense, but still very similar to that often complained of in aneurism of the thoracic aorta.

The diagnosis of aneurism of the heart must, in the present state of our knowledge, necessarily remain very doubtful. As Dr. Elliotson has observed, "the general symptoms which occur may well be supposed, by those who know the value of auscultation, to leave the nature of the disease in doubt."* Indeed, it is not to be expected that a diagnosis will ever be effected, without the aid of the information to be derived from an acoustic and manual examination. Unfortunately, the cases in which the physical signs have been observed are very few in number. In three cases, (18, 27, 31,) the impulse of the left ventricle is stated to have been increased; in one, (34,) the action of the heart generally was forcible and tumultuous; and in two others, (33, 39,) feeble and obscure. In four cases, (18, 31, 36, 37,) a bellows or rasping sound was heard with the ventricular systole; and in a fifth case, (47,) a similar sound was heard to the left of the sternum. In one case, (33,) the character of the first sound was short, like that of the second.

The following communication, with which I have been favoured by Dr. C. J. B. Williams, relieves me from the necessity of offering many observations of my own on the physical diagnosis of this lesion. Any views entertained by so distinguished an auscultator cannot fail to be received with the attention which they so justly merit, and I feel myself particularly

* Diseases of the Heart, 1830, p. 28.

happy in being the medium of his communicating them to the profession.

"MY DEAR SIR,

"I do not find that I have notes of any cases of partial aneurism of the heart which furnished physical signs distinctive of this affection. In fact, the partial dilatations were inconsiderable, and discovered only after death.

"The only peculiar set of signs, that I can conceive to mark this affection, would be a pulsating tumour, felt between the ribs; with dulness on percussion, beyond the usual limits; perhaps with some displacement of the heart. The sound heard at the pulsating spot would probably be a short loud one with the systole of the ventricles, (provided that systole be strong,) perhaps accompanied with a whizzing, if the sac were elastic and its neck narrow. Such a set of signs could only be presented where the aneurism is large; and to distinguish it from aneurism of the descending aorta, it would be necessary to observe that its impulse does not follow, but accompanies the first sound of the heart, as heard at the sternum, and that there is no unusual pulsation or grating sound to the left of the dorsal spine.

"According to its position, partial aneurism of the heart may produce various other signs, but of no distinguishing character. Thus, when at the apex of the heart, or in the neighbourhood of the columnæ carneæ, it could scarcely fail to derange the nicely adjusted function of the mitral valve; and the conse-

quent regurgitation through the left auriculo-ventricular orifice would (where the ventricular systole is strong) be manifested by a blowing murmur below the left mammilla, less distinct at the sternum and in the carotids. Again, when near the aortic orifice, it might dilate this aperture, and render the semilunar valves insufficient to close it: hence a whizzing, grating, or cooing murmur with or instead of the second sound. If the aneurism extends to the root of these valves, and opens a false passage into the aorta, there would probably be a double or to-and-fro murmur, of a grating or whizzing character, heard both at the sternum and in the carotids, occasioned by the forcible flux and reflux of the blood at the ventricular systole and diastole, through the irregular opening.

"I doubt that the sac itself would be likely to become the seat of any other sound than that of the shock from its sudden tension at each ventricular systole. A dilatable sac with a narrow neck might, however, as in the case of arterial aneurism, give a to-and-fro whizzing; but I question whether partial aneurisms of the heart be of that character.

"You see that I speak from principles rather than from experience in this particular lesion. They seldom fail in the simpler forms of disease; but in those more complicated, they become involved with the x, y, z properties of the subject, and elude our analytic powers.

"Yours, very faithfully,

"C. J. B. WILLIAMS.

"Half-moon Street, Oct. 20, 1837."

The lesion with which I think aneurism of the heart would be the most likely to be confounded, is an aneurism of the ascending aorta either directly above the valves, or of one of the sinuses of Valsalva themselves. In cases of this kind, I think there is reason for suspecting that the impulse and murmur would be present not only *after* but *during* the ventricular systole, so that the ground of distinction between cardiac and aortic aneurism, which is laid down by Dr. Williams, would be wanting. Indeed, aortic aneurisms, in this situation, from their proximity to the heart, into the substance and cavities of which they are apt to burrow and even become ruptured, would be likely to give rise to a group of signs almost identical with those of cardiac aneurism*.

The signs of a spontaneous varicose aneurism of the heart, would of course be analogous to those of a congenital perforation of the interventricular septum; and, like that lesion, would in an otherwise healthy and well formed subject, give rise to an admixture of the arterial with the venous blood; but in case of there being an impediment to the pulmonary circulation, or in that of the right ventricle acquiring greater power than the left, the opposite form of admixture, or that of the venous with the arterial blood, would ensue with its usual consequence—cyanosis.

The sound which would be heard in a case of this

* In a case of aortic aneurism which opened into the right ventricle, under Dr. Roe, in the Westminster Hospital, I at first concluded, from the rational and physical signs, that an aneurism of the left auricle was present.

description would, I have little doubt, be a blowing or rasping murmur with the ventricular systole, and much louder than any that would be likely to be met with in cases of simple aneurism of the heart.

So far as our knowledge of this affection at present extends, we cannot but regard its prognosis as being of the worst description, and even more fatal than that of the internal aneurism of arteries; in which there is a much greater tendency to a spontaneous cure than appears to be the case in aneurism of the heart. In giving an opinion in a case of this kind, it will be very important to bear in mind the great frequency of a suddenly fatal termination.

The treatment of this disease does not appear to offer any peculiar indications. A judicious combination, as far as practicable, of that which is appropriate to dilatation of the heart, with that which is recommended in aortic aneurism, with the view of producing obliteration of the sac, would probably be the most advantageous. As far as experience at present goes, we find that in five instances in which the effects of remedies are noticed, relief was afforded by an antiphlogistic form of treatment, of which in four cases bleeding formed a part. In no disease of the heart, probably, ought stimuli of all kinds, moral and physical, to be more strictly avoided than in this.

ANEURISM OF THE AURICLES.

The number of cases of aneurismal dilatation which are recorded as having occurred in the left auricle, is much less than that which we have seen to be the

case in the ventricle. The disease would appear, from the preparations which I have inspected, and the cases which have been recorded, to have been nearly uniformly of the diffused kind, and to have generally involved the entire sinus of the auricle. (B. 2, 3, 4, 6, 7, 8, 9*.)

The dilated walls of the cavity are often thickened, and the seat of fibro-cellular degeneration. The lining membrane is opaque, rough, and otherwise diseased, and in some cases even ossified, (3, 4,) and is lined with fibrinous layers, very similar to those met with in arterial aneurisms. In all these cases, the lining membrane appears to have been continued into the interior of the dilated portion, which consequently merits the name of true aneurism. Occasionally, (5, 11,) the dilatation is confined to the auricular appendage, which becomes excessively distended with lamellated concretions.

In all the cases with which I am acquainted, answering to this description, whether occurring in the sinus or appendage of the auricle, and which are nine in number, the disease was connected with, and appears to have been dependent upon, an extreme contraction of the mitral orifice, producing a difficult transmission of the blood from the left auricle. As the contraction of the mitral orifice is one of the most common lesions of the heart, I cannot but incline to the opinion that many of the cases, which have been reported as exhibiting a simple dilatation of the left

* The references in this division of the paper, relating to aneurisms of the auricle, are to Appendix B.

auricle in connexion with it, were really cases of aneurismal dilatation.

Through the kindness of Mr. Stanley, I am enabled to submit to the Society a drawing exhibiting the disease in one of these cases, the preparation of which is preserved in the museum of St. Bartholomew's Hospital. (7.) This specimen has already been alluded to by Dr. Latham, in reference to the diseased condition of the auricle, to which, however, he has not applied the name of aneurism*. It has likewise been adverted to by Dr. G. Burrows, in his Croonian Lectures on the pathology of the blood †.

In one case only with which I am acquainted, was the aneurism of that circumscribed kind to which the term *lateral* or *sacculated* could be applied. In this case, (10,) there was a sac as big as a nut hanging over the base of the left ventricle, and containing dense fibrinous concretions and liquid blood, which communicated with the cavity of the auricle by a canaliculated pedicle an inch in length.

The case related by Penada ‡, which has been cited by Dezeimeris and Ollivier asone of aneurism of the left auricle, was, I incline to think, after an examination of it and of the accompanying engraving, merely an instance of ulceration.

* Medical Gazette, Vol. III. p. 118.

† Medical Gazette, Vol. XVI. p. 650.

‡ Mem. di Mat. e Fisic. del Soc. Ital. Tom. XI. p. 545.

CASE VIII.

Aneurismal dilatation of the left auricular appendage; great constriction of the mitral orifice; adherent and ossified pericardium.

John B——, aged fifty-four, had suffered from palpitation of the heart, cough, and difficulty of breathing during four years and a half; his symptoms had always been increased by the least exertion, and relieved by occasional depletion from the arm. He had been addicted to excessive drinking. When Mr. Langstaff saw him, the pulse was ninety-nine, very small, and constantly irregular; the countenance was expressive of great anxiety; the lips blue; the feet and legs œdematous. He died suddenly, five months after coming under Mr. Langstaff's care.

Dissection.—Fluid was found in the abdominal cavity. The liver very firm; its blood-vessels small, and peritoneal covering thickened. The spleen large, its capsule thickened, and partly cartilaginous. There were upwards of four pints of serum in the right pleura, and two pints in the left. The lungs were highly œdematous, and the bronchial tubes loaded with bloody mucus.

The heart was very large, and the pericardium universally adherent. On several parts of the reflected pericardium there were large patches of osseous matter. The auricles were enormously distended with very dark blood. The right auriculo-ventricular opening was constricted, but the left much more so, and the margins of the mitral valve were very much

thickened. In the left auricle, an aneurism by dilatation had formed in the appendage, it being very much enlarged, and filled with layers of coagulum. The left ventricle was very large; the sigmoid valves healthy; the aorta small.

The description of the disease as it exists in the heart, I have taken from an examination of the preparation, (No. 1449,) which has been deposited in the museum of the Royal College of Surgeons. I mention this, as it differs somewhat from the account furnished me by Mr. Langstaff, and also from that of Dr. Thomas Davies, in a short notice which he has given of the same case.

But it is not in cases of contracted mitral orifice only that the left auricle is liable to become the seat of aneurismal dilatation, as a case which was communicated to Dionis shows (1). A soldier who had deserted, whilst in fear of pursuit, struck the left side of his chest forcibly against a tree, by which he was thrown from his horse. From this time he became the subject of severe pain, palpitation, and dyspnœa; and a large pulsating tumour gradually formed to the left of the sternum, which at last extended from the clavicle to the fifth rib. He died about a year after the accident. In addition to ununited fracture of the first four true ribs, empyema, and abscesses in the lungs; the left auricle of the heart was found of immense size, giving rise to the external tumour. The pleura, or probably rather the pericardium, adhered closely to the enlarged auricle, the walls of which were an inch thick, of a

dense cartilaginous structure internally, and full of grumous blood. The aorta, venæ cavæ, and pulmonary artery and veins were healthy.

Whether the aneurismal dilatation of the auricle, which in this case was consecutive to external violence, originated in an imperfect rupture of the coats of the auricle, or whether it depended simply upon the consequences of the inflammation set up in those coats, I shall not pretend to determine.

In conformity with the views expressed in a preceding part of this paper, relative to the distinction which exists between the diseases of the right and left sides of the heart, I ought not, perhaps, in this place, to treat of dilatation of the right auricle. As, however, casting further light upon some of the causes of this lesion generally, I have briefly alluded in the appendix, to two or three cases (*1, *2, *3) in which the right auricle was the seat of a lesion analogous in many respects to aneurism of the left auricle.

The most remarkable of these appears to be the case of the captain of a vessel, also related by Dionis, (*2,) who, after making powerful efforts to restrain a fit of violent anger, experienced dyspnœa and severe palpitation, with a pricking sensation about the heart. He died twelve years after the commencement of these symptoms, having previously suffered from anasarca, cold extremities, a great disposition to sleep, and his death having been preceded by profuse epistaxis. The right auricle was found enlarged to the size of the head of a newly born infant, and contained a pint and a half of semi-coagulated blood. The

dilated auricle was lined with a scaly osseous substance like egg-shell, which kept it stretched. The pericardium was firmly adherent. Dionis attributes this immense dilatation to the distention and partial rupture of fibres; which occurred in consequence of the sudden ingress of blood into the auricle, during the violent fit of rage.

In the first class of cases of aneurism of the left auricle, or those in which an aneurismal dilatation existed in connexion with extensive narrowing of the mitral orifice, the attending symptoms would probably be chiefly dependent upon this circumstance, and the lesion would not be one of much practical importance; nor do I think that a diagnosis could be formed between it and simple dilatation of the auricle. Whether the diagnosis would be more certain in the remarkable cases which were consequent either upon external or internal injury, and in which the auricles attained such an immense size, (1, *1, *2, *3,) further experience, aided by auscultation, can alone enable us to decide.

ANEURISM OF THE VALVES OF THE HEART.

The valves of the heart themselves, as was previously observed, are sometimes the seat of dilatations, which may properly enough be styled aneurismal. Morand (C. 1*) and Laennec (2) have each published a case of this partial dilatation occurring in the mitral valve, in the form of a little pouch which projected into

* The references in this division of the paper, relating to aneurism of the valves, are to Appendix C.

the left auricle. In both these cases, the aortic valves were the seat of extensive ossification, so that great obstruction to the passage of the blood into the aorta must have existed. Indeed, I think it not improbable that this circumstance determined the dilatations, which possibly occurred in the valves rather than in any other part of the walls of the ventricle, in consequence of their being weaker than usual, either from congenital or acquired defect.

CASE IX.

Aneurismal dilatation of the right portion of the mitral valve, with perforations of the sac.

Mr. South has briefly alluded to another "case of this flask-like protrusion of the mitral valve into the left auricle, in which there are three small holes, and the preparation of which (No. 1444) is in the museum of St. Thomas's Hospital." (3.) This preparation I have examined carefully; the sac is seated in the large or right portion of the valve, and encroaches considerably upon the septum of the auricles, which is, as it were, pulled down, so as to form part of the sac; a circumstance which probably depended upon the tendinous ring, to which the margin of the mitral valve is attached, having likewise given way.

The sac would contain a large walnut; and in the substance of the interauricular septum directly above it there is a distinct ecchymosis. The only aortic valve which remains in the preparation appears perfectly healthy.—(See Plate IV.)

Sir Astley Cooper has alluded, in his published lectures, to a case of "aneurism *in* the left auricle;" and he has favoured me with an opportunity of having

a copy taken of a drawing of the diseased parts, which is in his possession. I at once recognized the drawing as belonging to the case at St. Thomas's, alluded to by Mr. South, and the history of which is given in the following note which I have received from Sir A. Cooper.

" October 7th, 1837.

" MY DEAR SIR,

" Any draughtsman may take the drawing you wish, and you will of course give your own explanation of the preparation, which I have not sufficiently investigated to have made up my mind respecting.

" The heart was sent to me by Mr. Postlethwaite, and I added it with numerous others to the collection at St. Thomas's Hospital whilst I was delivering lectures at that institution.

" Yours truly,

" ASTLEY COOPER."

I have been kindly furnished by Mr. Postlethwaite, of Chichester, with a few additional particulars of the case, the history of which may now be stated as follows.—A soldier, aged about thirty, in the Sussex militia, to which regiment Mr. P. was surgeon, but whose previous history is unknown, suffered from symptoms of diseased heart, with ascites and œdema. In Mr. P.'s visits, he was frequently observed in a peculiar posture, clothed and out of bed, with his bent knees resting on one side of the bed, his hands on the other side; a position which he thought favourable to the relief of his occasionally difficult respiration. The commanding officer was

informed that his sudden death might be expected, for his pulse distinctly marked the irregular action of the heart. He died suddenly at Fort Pitt, Chatham, about the year 1812.

The three preceding cases are the only ones on record, that I am acquainted with, in which an aneurismal dilatation of the valves of the heart had occurred. The two following cases will shew that this lesion is not confined to the mitral valve.

CASE X.

Cyanosis; congenital opening in the interventricular septum; four aneurismal dilatations (varices?) of the tricuspid valve.

In the museum of the Royal College of Surgeons, (No. 128 of the series of malformations,) is "an adult human heart, having an aperture of communication between the ventricles in the upper part of the septum," which is not further described in the catalogue, but which affords a very beautiful example of four aneurismal pouches in the tricuspid valve. The opening in the septum, which would admit of the introduction of the thumb, is directly below the origin of the aorta; its lower border being a smooth semilunar ridge. Upon passing a probe through this opening directly forwards into the right ventricle, it enters a membranous pouch, the size of a large nutmeg, the convexity of which is directed towards the centre of the ventricle. This pouch, which has a rather fibrous character, is formed either solely of that portion of the tricuspid valve which is connected with the septum, a supposition which is perhaps the more probable, or otherwise it is formed by

the membranous portion of the interventricular septum, which has become distended into a pouch, and has gained an additional covering from adhesion to the portion of the valve alluded to. The lower portion of the pouch is perforated by two or three holes. If instead of passing the probe directly forward, it be directed downwards and somewhat to the left, it enters the cavity of the ventricle, through a narrow chink between the two portions of the valve. Opposite, and rather to the right of this chink, is another pouch of about the same size as the first, but of a more delicate structure, and evidently formed simply by the dilatation of the anterior portion of the valve. The convexity of this pouch is directed towards the parietes of the ventricle; so that during the systole of the heart, when the valve was acting, whilst the first pouch would project upwards into the auricle, this would depend into the ventricle. Behind this last described pouch, two small ones, the size of peas, and having the same direction, are concealed.

The mitral valve is slightly, and the tricuspid in a much greater degree, thickened at its free border. There is some opacity of the endocardium around the opening in the septum, which is more marked on the right than on the left side. The origins of the aorta and pulmonary artery are normal.—(See Plate V.)

Hitherto I have to regret that I have not been able to meet with any further history of this very curious pathological specimen, than that it was taken from a "blue boy," by Mr. Lawrence Healey, by whom it was deposited in the museum.

Upon further consideration I have discarded the

idea which I at first entertained, that the opening in the septum of the ventricles, in this case, was not a congenital malformation, but that it was the result of a previous dilatation of that portion of the septum which is not furnished with muscular fibres, and which I have described in a previous part of this paper. (p. 222.) Whichever view, however, be adopted, the mechanism by which the dilatations of the tricuspid valve were produced is, I think, sufficiently obvious. During the ventricular systole, the blood was doubtless propelled by the left into the right ventricle, through the opening in the septum, and had impinged on both surfaces of the valve; and hence had resulted four dilatations; the first and largest of which was directed towards the centre of the ventricle, whilst the three smaller ones were directed towards its walls. The case, I think, satisfactorily establishes that when an abnormal communication between the right and left cavities of the heart exists, much admixture of the venous with the arterial blood does not necessarily ensue, but on the contrary, that the arterial blood is propelled into the right cavities of the heart, and is circulated with the black blood.

This condition, which is just the converse of that necessary for the production of cyanosis, has been too generally overlooked by authors in their speculations on malformations of the heart; but its possibility is distinctly adverted to by Corvisart, who even makes some observations upon the probable physiological effects of such an admixture *.

* Corvisart, Diseases of Heart. By Hebb. 1812. p. 256.

In the case now described, however, both kinds of admixture had doubtless been present, possibly in consequence of some obstruction in the course of the pulmonary circulation.

For the particulars of the following interesting case I am indebted to the kindness of Dr. Watson.

CASE XI.

Aneurismal dilatation of one of the two aortic valves, the third congenitally absent: eccentric hypertrophy of the left ventricle of the heart: mottled kidneys; subacute pericarditis, and fatal hydrothorax.

Thomas Glindon, aged 30, was admitted July the 14th, 1835, into the Middlesex Hospital, under the care of Dr. Watson. Anasarca of five weeks' standing in the legs, and of three weeks' in the hands and face; ascites; palpitation and breathlessness, especially on exertion; requires a high pillow, posture in other respects indifferent; dreams a great deal. Pulse 100, with power, intermitting; bowels relaxed; urine scanty, very acid, albuminous.

He professes temperate habits. Six years ago he was confined to bed for six weeks with rheumatic fever, and had breathlessness then for the first time. He got perfectly well from this attack. He has been subject to palpitation and dyspnœa for four or five years, and has had pain in the loins.

Auscultation.—July 17th. There is an unnatural sound with each action of the heart; with the systole, a rough harsh bellows sound, most audible near the middle of the sternum, and two inches and a half

above the level of the nipple. Both these sounds are less distinctly heard over the apex of the heart.

On the 28th he was attacked suddenly with a great increase in the dyspnœa, drawing deep inspirations at long intervals; he was barely sensible, and talked rather incoherently; but these symptoms were quickly relieved by the application of cold washes to the head after the hair had been removed, and by a blister to the nape of the neck, with a few doses of tartar-emetic.

30th. The blowing sound attending the diastole of the heart is louder than before. He has some pain in the præcordial region, for which twelve leeches are to be applied.

During the months of August and September, he took digitalis and other diuretics and drastics, and at one time his mouth was brought freely under the influence of mercury, but without much advantage.

September 8th. The heart again examined; its sounds are tumbling, three in number, the systole being apparently composed of two, the second of which is faint, short and supplementary. The rhythm is anapæstic. The rush accompanying the diastole is no longer audible.

19th. During the night he had a very severe attack of dyspnœa (from the effusion of fluid into the left cavity of the chest). He lies on the left side, which is œdematous. On the left side posteriorly no vesicular breathing is audible, but in this situation both the breathing and the voice are strongly bronchial; (ægophony?). On the left side, in front,

the respiration is inaudible. Heart's action rapid, obscurely marked, and heard all over the front of the chest.

25th. He died; the morbid sounds which were heard with each movement of the heart, soon after his admission, having been absent during the last month of his life.

Dissection.—The superficial veins, especially on the arms and shoulders, delineated by purple lines. Anasarca general; much serum in the abdomen, and likewise in the right pleura, so as to float the lung high. There was still more serum in the left pleura, where at first the lung was not visible; it was small, flabby, slightly adherent at the summit, non-crepitant, and only a small part of its upper portion floated in water, the air being compressed entirely out of the remainder; it was not diseased in structure. The right lung was imperfectly crepitant.

The pericardium contained a large quantity of fluid, which was both turbid and reddish, and resembled thin pus stained with blood. I doubt whether it was actually purulent. There were no adhesions, but near the apex of the heart there was a rough spot, about half an inch square, consisting, apparently, of a deposit of lymph; and there was a corresponding spot on the opposite point of the free membrane.

The heart, large in itself and in all its cavities. The right ventricle as thick or thicker than natural. The left more thickened, but still more dilated than

thickened. The valves natural or nearly so, except the aortic; these were only two in number, and were thick and fleshy, and rough on their ventricular surfaces. The edge of the one was smooth, that of the other rugged; there was a deposit of ossific matter at their points of attachment. From the ventricular surface of the valve with the smooth border, there projected a little bag that would hold a swan-shot, and which opened by a little round mouth on the aortic surface of the valve. It had two little slits in its most depending portion, and was evidently formed by a dilatation of the valve itself. The two valves met tolerably close at their edges, so as not to allow of much regurgitation between them. The blood was fluid; the aorta small, its lining membrane and that of the heart stained of a deep red.

The kidneys were of a pale greenish colour externally, resembling verd-antique; a section having been made, the cortical part was found of a greenish white colour. Mr. Kiernan, who injected one of the kidneys, did not, by this means, detect any organic change. The mucous membrane of the small intestines was here and there red, with an arborescent injection of the vessels. The same membrane lining the cæcum appeared thickened.

I shall not do more here than observe upon the above case, which is replete with interest, that it would appear to have been one of those complicated ones in which the heart and kidneys are almost equally in fault; although the disease of the heart, consecutive to a rheumatic endocarditis, was most probably

the primary affection. The sudden effusions, however, which took place into the pleura, and probably also into the arachnoid, and the low unhealthy form of pericarditis which occurred in the later stages of the disorder, are points in the history of the case which associate the dropsy more with renal than with cardiac disease.

The formation of the aneurismal dilatation of the aortic valve must have been much facilitated by the congenital absence of one of their number; whence they must have been much less capable of adequately supporting and reacting against the column of blood in the aorta, during the diastole of the heart. This view is supported by a preparation in the museum of Guy's Hospital, (No. 1427 F,) shewing the same congenital absence of one of the valves of the aorta; in which one of them is the seat of a large perforation, having an irregular border studded with osseous excrescences, and which most probably was produced by a rupture. The double bellows sound which was most audible in the neighbourhood of these valves, I should suppose may be referred,—the first, or systolic, which was "rough and harsh," to the obstruction which was produced by the pouch itself, and likewise by the osseous patches in one of the interspaces of the two valves; the second, or diastolic, which is spoken of as "a rush," to the regurgitation which must have occurred through the perforations in the aneurismal sac.

I shall only add to this paper, a very few observations on the history of aneurism of the valves of the heart, in addition to those which are appended to the

particular cases. I should be inclined to believe that, generally speaking, aneurisms of the valves of the heart originate in a progressively advancing dilatation, unpreceded by rupture or ulceration; and that in fact they are true aneurisms.

It is, however, possible that the aneurismal dilatation may have been preceded in some cases by the destruction of one of the laminæ of the endŏcardium forming the valve affected; and in such instances the lesion must of course be regarded as a false aneurism.

The constantly recurring movements to which these portions of the heart's structure are subject, are obviously unfavourable to the formation of coagula in aneurismal pouches in these situations; and indeed it does not appear that such coagula had formed in any of the cases.

It is perhaps scarcely necessary to point out that a lesion of this description must necessarily act, in a more or less decided manner, as an obstruction to the flow of the blood out of the cavity immediately behind the valve which is the seat of such lesion; and that if the aneurismal sac be perforated, either as the result of ulceration or rupture, a regurgitation of blood will be permitted from the cavity in front of the diseased valve. It will hence follow that the diagnosis of aneurism of the valves will, for practical purposes, resolve itself into that of obstructive and regurgitant valvular disease; upon which any observations of mine would be superfluous after the information we have respecting it, in the different

standard works upon diseases of the heart in general, and especially in those of Drs. Hope and Williams.

Westminster Hospital,
November, 1837.

APPENDIX;

Shewing the authorities for Seventy-four Cases of Aneurism of the Heart, with additional information respecting preparations examined by the author.

A.—FIFTY-EIGHT CASES OF ANEURISM OF THE LEFT VENTRICLE.

1. *Galeati.* Comment. Bonon. 1757, Tom. IV. p. 26. (Aneurism ruptured; good history.)—2. *Walter.* Nouv. Mém. du Berlin, 1785. (Figure.) also *Boas.* Cordis Rariss. Aneurism. 1826, with good plate and description. (A. at apex. Prep. at Berlin.)—3. *Baillie.* Morb. Anat. 1793, and Engr. 1799. (A. at apex. Prep. at Glasgow.)—4. *Beauchamp.* Rec. Per. de la Soc. de Méd. Tom. V. 1799, said by Dezeimeris, (Arch. Gén. de Méd. Tom. XXI. p. 336,) to be the same case with that of *Corvisart*, Mal. du Cœur, 1806. Hebb's Transl. p. 241. (The cases agree in many points, but by the one author the aneurism is compared in size to the heart itself, by the other it is stated to be one-third larger than the head of the femur.)—5. *Corvisart.* Op. Cit. p. 398, Case 56. (A. true; in centre of interventricular septum. Not published as aneurism by Corvisart. No history.)—6. *Hodgson.* Dis. of Art. and Veins, p. 84, Case 13. (A. probably true; at apex. Not described as aneurism by the author. History.)—7. *Zannini.* Anat. Patol. di Baillie, Tom. I. p. 27, 1819. (A. size of fist near apex. A good history.)—8. *Rostan.* Sur les Ruptures du Cœur. Obs. V. 1820. (Not published as aneurism; fatal rupture near the sac. History.)—9. *Shaw.* Manual of Anat. Vol. I. p. 119, 1822. (A. without tumour; ruptured.)—10. *Cooper.* Lect. on Surg. by Tyrrell, Vol. II. p. 27, 1824. (A. size of fist at middle of ventricle; pericardium adherent over sac, ruptured into left pleura. Sir A. C. to Author. History.)—11. *Cooper.* Loc. Cit. and *Elliotson*, Dis. of Heart, 1830. p. 28. (No history. Prep. at St. Thomas's Mus. 1445. A. about as large as heart, placed laterally to it, opening near apex, by mouth with thick lips; half filled with coagula, and pericard. adhering to tumour. Prep. examined by author.)—12. *Laennec.* De l'Auscult., &c. 1826. Forbes's 4th Edit. p. 513. (A small A. in an ulcerated passage in the interventricular septum. Varicose aneurism of the heart? Perhaps doubtful.)—13. *Berard.* Thesis

(Paris.) sur l'Anat. Path. 1826. (A. size of apple at apex. No history.)—14. *Berard.* Loc. Cit. (A. like the last. Some history.)—15. *Cruveilhier.* Nouv. Biblioth. Méd. Tom. II. p. 72, 1827, et Anat. Path. Liv. XXII. 1835. (A. size of walnut, side of V. Good history.)—16. *Johnson.* Med.-Chir. Review, April, 1827. (A. small, near aorta, and ruptured. History; General Kyd.)—17. *Biett.* Rep. Gén. d'Anat. Tom. III. p. 99, 1827, et *Breschet,* Loc. Cit. p. 198. (A plate and history. A. size of orange. The celebrated Talma.)—18. *Dance,* by *Breschet.* Loc. Cit. p. 194. (A. size of walnut at apex. Good history.)—19. *Breschet.* Loc. Cit. p. 199. (A plate; no history. A. size of orange at base. Prep. in Mus. of Faculty of Med. Paris.)—20. *Harrison,* by *Adams.* Dublin Hosp. Rep. Vol. IV. p. 353, 1827. (A. nearly size of heart, at apex; almost presenting externally. A good history.)—21. *Adams.* Loc. Cit. (Prep. in Mus. Park Street, Dublin. A. size of walnut. Sudden death. No further history.)—22. *Bignardi.* Ann. Univ. di Med. 1829; and *Bouillaud,* Mal. du Cœur, Tom. II. p. 507. (A. size of bean; true; ruptured. Short history.)—23. *Reynaud.* Journ. Hebd. No. 22, 1829. A figure; also one by *Carswell.* Hypertrophy, plate 2, figure 1. (Two true A. in side of ventricle. No heart symptoms. Herniary aneurism of the heart.)—24. *Reynaud.* Loc. Cit. and Cat. Mus. Fort Pitt, Chatham, 1833. Prep. No. 38. (A. size of fist nearly, at centre of V.; apparently true A. at first; lining membrane, evidently being prolonged into it for some distance. Pericard. adherent over sac. Fibro-cellular degeneration of muscular fibres around; history. Examined by author.)—25. *Anonymous.* Med.-Chir. Review, Vol. XV. p. 252, 1829. (A. size of walnut, at base; true. Slight history.)—26. *Hodgkin.* Cat. Mus. Guy's Hosp. No. 1396, A. 1829. (A. size of apple at apex; probably false; containing a non-laminated coagulum; pericard. had adhered. A short history. Prep. examined by author.)—27. *Elliotson.* Dis. of Heart, p. 28, 1830, and Med.-Chir. Review, Vol. XII. p. 174. Hist. and engr. Prep. in Mus. St. Thomas's Hosp. No. 1445, B. and C. (Two A. one size of apple, the other smaller, at side of V. near the base. Probably true; lining membrane traceable into larger sac, and evidently lining smaller one; which has two or three openings between the fleshy meshes. Pericard. adhered over tumour formed by larger sac. Examined by author.)—28. *Brookes.* (*Josh.*) Cat. Mus. p. 45. 1830. No. hist. Prep. now in Mus. Guy's Hosp. No. 1396, B. (A. size of heart at apex; apparently formed by the uniform dilatation of the lower half of V.; diffused true aneurism. No lips to sac, but lining membrane and atrophied fleshy columns traceable over nearly the whole of its interior. Examined by author.)—29. *Hunter* (*J.*) Cat. Mus. R. Col. Surg. Lond. 1830. Path. Prep. in Sp. No. 363. (Two A. at base of V. see preceding paper. No history. Examined by author.)—30. *Stanley.* Cat. Mus. St. Barth. Hosp. 1831. Prep. No. 30. No hist. (A. size of pigeon's egg, about centre of V. evidently true. Lining membrane opaque, and fibro-cellular change of the muscular fibres around the sac; over centre of which pericard. adhered. Herniary aneurism of the heart. Examined by author.)—31. *Hope.* Dis. of Heart, p. 592, 1832. (A. size of nut, directly under an aortic valve, and opening both into ventricle and aorta. Dissecting aneurism of the heart. History.)—32. *Hope.* Loc. Cit.

286. (A. with same relations as last. Dissecting aneurism. Short history.)—33. *Hope.* Loc. Cit. p. 250 and 551, Case 10. (A. small, true, at apex; great general dilatation. History. Not published as aneurism by Dr. Hope.)—34. *Petigny.* Journ. Hebd. Tom. XIII. 1833. (A. about the size of heart; at apex. Good history.)—35. Cat. Mus. Fort Pitt, Chatham, No. 37, 1833. (A. size of large walnut; at apex; probably false; muscular substance ending abruptly around sac. Pericard. not adherent, but covered with false membranes over lower half of ventricle. Very little history. Examined by author.)—36. *Hope.* Morb. Anat. p. 85, 1834, Fig. 67. (A. size of egg; similar to Nos. 31 and 32 in its relations. Dissecting aneurism. Short history.)—37. *Hope.* Loc. Cit. (A. size of walnut. Dissecting aneurism. Short history.)—38. *Choisy.* Thesis (Paris.) No. 137, 1834. (A. size of egg; at base. Short history.)—39. *Cruveilhier.* Anat. Path. Liv. XXI. 1835. 3 Figures. (A. very extensive. Diffused true A. of heart? History.)—40. *Cruveilhier.* Op. Cit. Liv. XXII. Engr. (A. at apex. No history.)—41. *Cruveilhier.* Op. Cit. Liv. XXII. (A. small; at base. No history.)—42. *Cruveilhier.* Op. Cit. Liv. XXII. No history. (A. true; lower half of interventricular septum.)—43. *Sims.* Med.-Chir. Trans. Vol. XIX. p. 401, 1835. (A. true; at base. History as to cerebral disease.)—44. *Davies.* Dis. of Lungs and Heart, p. 402, 1835, and *author;* Case 3. Prep. in possession of Mr. Langstaff. (A. true; at base. Herniary aneurism of the heart. Examined by author. History.)—45. *Carswell.* Illustr. Fasc. 9. Hypertrophy; plate 3, fig. 2. Prep. in possession of Dr. C. (A. four in number; base and apex; true. Examined by author. No history.)—46. *Carswell.* Loc. Cit. plate 3, fig. 3. (Diffused true aneurism. No history.)—*Author. The following eleven cases, now first published.* 47 to 52. See preceding paper, Nos. 1, 2, 4, 5, 6, and 7.—53. Prep. No. 597, IX. M. A. University Coll., London. (A. size of large orange at base of V. No history.)—54. Prep. No. 14, Mus. St. Barth. Hosp. (Diffused true A. of lower half of V. Not described as aneurism in catalogue. No history.)—55. Prep. No. 18, Mus. St. Bart. Hosp. (Two aneurisms, one, incipient at base; one, size of large walnut at apex, ruptured. Not described as aneurism in catalogue. No history.)—56. Prep. No. 42. Mus. St. Bart. Hosp. (A. size of nut, directly under and between the right and left aortic valves, the right coronary artery passing over the sac. Extensive ossification of all the aortic valves; from a female, aged 18. No further history.)—57. Prep. No. 654 *, Mus. Guy's Hosp. (A. at apex, size of a walnut, ruptured. Vide Eliz. Beachman's case, 12th green inspection-book.)—*The following case added whilst this paper was going through the press:* 58. *Lobstein.* Anat. Path. 1833, Tom. II. p. 501. (No history.)

B.—ELEVEN CASES OF ANEURISM OF THE LEFT AURICLE.

1. *Dionis.* L'Anat. de l'Homme, p. 713, 1716. (Very extensive; after external injury.)—2. *Abernethy.* Med.-Chir. Trans. Vol. I. p. 32, 1809. (Contr. mitral orif.)—3. *Burns.* Dis. of Heart, p. 35, 1809. (Contr. mitral orif.)—4. *Burns.* Op. Cit. p. 168. (Contr. mitral orif.)—5. *Hodgson.* Dis. of Arteries and Veins, p. 83, 1815. (Appendix of auricle; Contr. mitral orif.)—6. *Elliotson.* Dis. of Heart, p. 29, 1830. Two engr.

Prep. in Mus. St. Thomas's Hosp. No. 1445, A. (Sinus of auricle; contr. mitral orif.)—7. *Stanley.* Cat. Mus. St. Bart. Hosp. No. 19, p. 56, 1831. (Sinus of auricle; contr. mitral orif.)—8. *Stanley.* Op. Cit. No. 33, p. 57. (Sinus of auricle; contr. mitral orif.)—9. *Hope.* Dis. of Heart. Case 25, p. 599, 1832. (Contr. mitral orif.)—10. *Cruveilhier.* Anat. Path. Liv. XXII. 1835. (M. *Chassaignac's* case. Sacculated aneurism, size of a nut.)—11. *Davies.* Dis. of Lungs and Heart, p. 402, 1835; and *author*, Case 8. Prep. Mus. Coll. Surg. (Langstaff. No. 1449.) (Appendix of auricle; contr. mitral orif.)

Three cases of extensive dilatation (Varix?) of the right auricle: *1. *Borrichius.* Act. Hafniens. Barthol. Obs. 48, p. 150, 1676. (After external violence.)—*2. *Dionis.* L'Anat. de l'Homme, p. 713, 1716. An engr. (After violent anger.)—*3. *Bernhardi.* Obs. Ingent. Cordis Tumor. Regiom. 1826. An engr.——(None of the above Cases, excepting Nos. 6, 10, and 11, appear to have been described, by their respective authors, as instances of aneurism, in the proper acceptation of the term.)

C.—FIVE CASES OF ANEURISMAL DILATATION OF THE VALVES OF THE HEART.

1. *Morand.* Hist. de l'Acad. Roy. des. Sc. pour 1729; 1731. (Mitral valve.)—2. *Laennec* and *Fizeau.* Bul. de la Fac. de Méd. Tom. I. p. 207, et Bouillaud. Traité Clin. des Mal. du Cœur. Tom. II. p. 510. (Mitral valve.)—3. *Sir A. Cooper.* Lect. by Tyrrell, Vol. II. p. 27. *South* in Otto's Path. Anat. 1831, p. 281; and *author*, Case No. 9. (Mitral valve. Prep. in Mus. St. Thos. Hosp. 1444.)—4. *Author.* Case 10. Prep. in Mus. Coll. Surg. No. 128. (Tricuspid valve; four sacs.)—5. *Author.* Case 11. Dr. Watson's case. Prep. in possession of Mr. A. Shaw. (Aortic valve.)

D.—SEVEN CASES FROM THE OLDER AUTHORS, DESCRIBED CHIEFLY AS CONNECTED WITH THE AURICLES OF THE HEART, SOME OF WHICH WERE PROBABLY ANEURISMS.

1. *Trafellmannus;* quoted by *Schenck.* Obs. Med. Rar. 1644. Obs. 8, p. 257.—2. *Puerarius.* Obs. Select. add. Thesaur. Med. Lib. III. p. 345.—3. Act. Nat. Cur. Cent. 8; p. 78.—4. Op. Cit. Dec. 2. Ann. 6; p. 415. 5. Op. Cit. Dec. 3. Ann. 5 and 6. Obs. 134.—6. *Bonetus.* Sepulchretum, 1700. Lib. II. Sect. 8. Obs. 30; and Sect. 11. Obs. 1. (This is most probably the case, quoted erroneously (?) by *Lieutaud* and *Corvisart*, from the Act. Nat. Cur.—Compare with *Bonetus*, *Lieutaud.* Hist. Anat. Med. Cardis Tumores. Obs. 554; and *Corvisart*, Diseases of Heart, by Hebb. p. 242. The case was evidently one of aneurism of some kind; possibly, however, of the very commencement of the aorta.—7. *Douglass.* Phil. Trans. 1714-16; Vol. XXIX. p. 326. Quoted erroneously by *Good*, (Study of Medicine, 1825, Vol. III. p. 475,) as a case of aneurism of the left ventricle. An aneurismal dilatation of the left auricle, however, possibly existed.

THE HISTORY

OF

A FEMALE

WHO HAS

FOUR MAMMÆ AND NIPPLES.

BY ROBERT LEE, M.D. F.R.S.,

PHYSICIAN TO THE BRITISH LYING-IN-HOSPITAL, AND LECTURER ON MIDWIFERY AT ST. GEORGE'S HOSPITAL.

READ JANUARY 9TH, 1838.

MRS. ——, æt. 35, was delivered prematurely of a still born child on the 21st July, 1835. Soon afterwards, the mammæ became excessively painful and distended, and she had a severe attack of fever with delirium. Though the symptoms became daily more aggravated, a week elapsed before she would permit the condition of the breasts to be ascertained. On inquiring into the cause of this unwillingness to allow the necessary examination of the mammæ to be made, I was informed by her sister-in-law, that she had two mammæ and two nipples on each side, and that this peculiarity, which she was anxious to conceal, had been observed ten years before, when her first confinement took place.

After long entreaty, I obtained leave to inspect the breasts, and was surprised to find that there were two on each side, as had been represented; the two of the

same side being separated by a deep oblique depression. The inferior or pectoral mammæ, as they were afterwards termed by Sir Astley Cooper, were fully developed and in the natural situation, and their nipples, areolæ and glands presented nothing unusual in their appearance. Near the anterior margin of the axilla, a little higher up on each side, was situated another mamma, about one-sixth the size of the others. The nipples of these were small and flat, but when gently pressed, a milky fluid, which had all the external characters of the milk secreted by the other breasts, flowed copiously and readily from several ducts which opened on their extremities. When milk was drawn from the lower breasts, a small quantity usually escaped from the nipples of the superior breasts, and when the draught came into the former, the latter invariably became hard and distended.

Mrs. —— had previously borne several living children, and five years before this period had twins, when she had a severe attack of uterine inflammation, and suffered much from painful distension of the two upper breasts. In consequence of the flatness of their nipples, she has never been able to suckle any of her children with these. The vagina, orifice of the uterus, and all the other organs, besides the mammæ, in this female are well formed.

I mentioned this case to Sir Astley Cooper at the time it first came under my observation, but he did not see it with me until the 28th February, 1836, several months after the secretion of milk had entirely ceased. When Sir Astley saw the mammæ, he said there

could be no doubt that there were two on each side, an axillary and pectoral breast, and that nature had separated them completely from each other. He considered it proper that some record should be given of a case, which he thought to be without a parallel in this country.

Mrs. —— again became pregnant, and was safely delivered on the 19th July, 1837, of a living child, which she now suckles with the pectoral breasts, and the axillary breasts again present the same appearances as those which have now been described.

The preceding case furnishes one of the best examples of quadruple mammæ in the human subject which has yet occurred. The following are the most striking histories of this variety of malformation, which I have met with in the works of foreign authors.

J. F. Lynceus states that he went from curiosity to see a Roman woman who had four breasts, of a beautiful form, ranged regularly above one another, and giving milk copiously.

An old physician at Basle was once consulted by a young wealthy heiress, who had four mammæ, and who wished to know in the event of her marrying, whether she would have three or four children at a birth, a prejudice with which some matrons had inspired her. Not being satisfied with the opinion of this physician, she addressed herself to the faculty at Tubingen. This lady married, and never had more than one child at a time.

About sixteen years ago, in the village of Pfullendorf in Germany, an aged woman who lived upon

alms, was exhibited as a great curiosity, who had four mammæ, perfectly equal, and placed symmetrically upon two parallel rows. Old age, misery, and want, gave to this female a very disagreeable appearance. If it had been possible, as she bent forward, to forget for an instant that she was a woman, it would not have been difficult to believe, that these four mammæ belonged to an individual of an entirely different species*.

The following case of quadruple mammæ was communicated by M. Champion of Bar le Duc to Messrs. Percy and Laurent, the writers of the articles Mammelle and Multimamme in the 30th and 34th vols. of the Dictionnaire des Sciences Medicales.

"Madame —— was delivered of her fourth child on the 15th February, 1818, which she did not suckle. The fourth day after, she began to complain of an uneasy sense of distension in the axilla, and of pains analogous to those experienced in the mammæ during puerperal turgescence. The fifth day, the uneasiness was so much increased as to attract my attention. On the right side, under the axilla, behind the edge of the great pectoral muscle, where it leaves the trunk, to form the anterior border of the axilla, was a tumour larger than a turkey's egg, flattened and irregularly circumscribed, painful without redness of the skin, which was covered with a fluid thicker than the ordinary perspiration of the axilla. A portion of the shift which corresponded with this tumour was moistened. This circumstance led me to compress the

* Diction. des Scienc. Medicales, Tom, XXXIV. p. 527.

tumour, which I at first considered to be a lymphatic gland, and there issued from six small openings, irregularly distributed over the centre of the gland, a milky fluid, similar to that which the other breasts afforded. I could have collected, by slight pressure, a quantity sufficient to fill a coffee-spoon. The openings were very small, and it was obvious, from the clothes covering them being always moistened, that milk kept constantly oozing from them. The flow of milk gradually diminished, with the size of the breasts. A similar gland was observed in the left arm pit, but it was neither so large nor so painful; and I counted only five instead of six apertures in it. On the 25th March, 1818, the gland of the right axilla was not larger than a flattened nut. Three divisions or glandules were observed in it, of which two were larger than the others. That of the left was much the smallest, and had only two lobes."

In the Journal de Médecine, l'an. II., Dr. Gardeur published the following case of quadruple mammæ which occurred in St. Domingo, and which has also been cited by Percy, but which is not considered as a perfectly authentic history by J. Geoffroy St. Hilaire*.

" Aglae, fille mulâtre, âgée de 19 ans, native du Cap, d'un blanc et d'une negresse d'une constitution robuste et sanguine et d'une humeur joviale, taille au dessous de la moyenne, et assez replete, porte quatre mamelles, dont deux placées dans le lieu ordinaire et bien conformées, et les deux autres près de l'aisselle à un pouce au des-

* Histoire des Anomalies de l'Organization, Tom. I. p. 712.

sous et en avant, ayant de sept à huit lignes d'élévation de la surface de la peau et de trois pouces et demi à quatre pouces de circonference, laissant apercevoir, au tact, sous les tegumens, de petits corps glanduleux et chacune terminée par un petit mamelon proportionné à leur volume. Elles ressemblent parfaitement à celles d'une jeune fille qui entre dans l'âge de puberté. Cette femme a eu un enfant à quatorze ans, et les mammelles extra naturelles ont donné du lait en raison de leur capacité. Je n'ai pu savoir à quel âge elle avait commencé à être reglée; suivant les apparences, elle a dû l'être fort jeune, et je crois, vers l'âge de onze à douze ans, et depuis ce temps elle l'a toujours été exactement."

In some women only one breast has been developed, others have had two nipples placed on one mamma, and a few individuals have had three breasts, two in the natural situation, and a third situated in the middle of the two others. Only one case has been recorded of five mammæ in the human subject*.

* Dict. des Scien. Med. Tom. XXXIV. p. 529.

RESULTS

OF

POISONING

BY

SULPHURIC ACID.

BY JOHN WILSON, M.D.,

PHYSICIAN TO THE MIDDLESEX HOSPITAL.

READ MARCH 27TH, 1838.

MAY I be allowed to lay before the Society for inspection, the œsophagus of a woman who died forty-five weeks after having swallowed a part of two-pennyworth of oil of vitriol; whose case was read at the College of Physicians, in July, 1834, the patient being then living, when a cylindrical tube, about eight or nine inches in length, which had been ejected by a violent fit of coughing, was placed on the table.

At that time, the patient had survived the injury six months, had gained some flesh, and soon afterwards went out of the hospital very much recovered, though still subject to atmospheric influence, suffering much at the approach and during cold, wet, and windy weather, but very much better when it was warm and dry; at intervals, the expectoration was

copious, sometimes as much as two pints of frothy mucus in twenty-four hours; when the difficulty in swallowing was the greatest, the pain extended from the pit of the stomach to the shoulders;—the nourishment was generally soft eggs, milk, strong beef tea, ale, and porter, with occasional sops.

She was readmitted in September following, and was then more reduced than when she left; but in a short time afterwards she improved much in looks, strength, and spirits, with some increase of flesh, from the nutriment already mentioned;—she derived the most relief from peppermint.

On the morning of the 14th of November, she had a shivering fit, preceded by vomiting, and followed by continued but ineffective retchings:—dyspnœa at times, with great distress and constant pain about the region of the stomach and lower ribs of the right side; bathed in constant sweats; countenance greatly altered. During the day she had exquisite suffering over the entire surface of the body, so that, as she expressed herself, "not an inch of her was free from severe pain." The wrists and other large joints became painful and swollen, but not red. For two nights was delirious and recognized no one:—slight relief was obtained from pieces of sugar saturated with laudanum. She died tranquilly on the 17th, nothing having been received into the stomach since the 14th; after having survived the swallowing of the acid forty-five weeks and three days.

Examination, eighteen hours after death.—Body extremely emaciated; the lower two-thirds of the

œsophagus thickened and narrowed, internally very vascular, irregular, and softened; the upper third shining like an old cicatrix. In the stomach, opposite to the spleen, was an opening of the size of a half-crown piece with softened edges; there was great softening of the mucous membrane of the stomach; the abdomen contained a quantity of dark coloured fluid, but no peritoneal inflammation.

It seemed most probable that the perforation of the stomach had taken place on the 14th, when the vomiting and rigors came on, followed by other distressing symptoms, and the greatly altered state of the patient. The contents of the stomach, which escaped into the abdomen, being only fluid, and her debilitated and exsanguine state, seemed sufficient to account for the absence of peritoneal inflammation.

When the difficulty in swallowing was very great, some thought it might have been advisable to pass a bougie down the œsophagus; but I never entertained that idea, and my colleague, Sir Charles Bell, was of my opinion; and the post mortem examination convinced others, who had before thought differently from us, that the passing, or attempt at passing, a bougie, would have, in all probability, accelerated the patient's death.

Sulphuric Acid retained by the stomach a quarter of an hour; death in twenty-two hours; mucous membrane of the stomach charred.

On the 3d of January, 1836, a young woman was admitted into the hospital at ten in the morning;

having taken, at twelve the preceding night, from two to three ounces of strong sulphuric acid, which remained on the stomach for a quarter of an hour, when she vomited a black ropy fluid.

On admission, she could only speak in a whisper, and was scarcely able to open the mouth, from which exuded a ropy mucus. Great tenderness from the pharynx down to the epigastrium:—pulse scarcely to be felt; extremities cold; every fluid ejected as soon as taken; frequently vomited a fluid of the consistence of treacle and colour of the carbonate of iron; disposition to doze; had no convulsion nor evacuation; and died at twelve the same night.

Inspection, fourteen hours after death.—Lining membrane of the mouth, pharynx, and œsophagus, of a silvery grey speckled appearance, like a snake's skin, from some of the carbonized matter adhering to the deeper parts of the rugæ, the more prominent being of a lighter appearance; the membrane of the tongue easily peeled off.

The stomach was very much distended, but contained only air, and when opened its mucous coat was nowhere visible, from its entire surface being covered with a black pitch-like substance, which did not wash off with ease, and when scraped it shewed the mucous coat of a pink colour, much swollen, but entire: the commencement of the duodenum had a similar appearance, which soon became less marked, and nearly disappeared at the beginning of the jejunum, when it gradually assumed the greyish appearance, somewhat like that of the œsophagus, but

of a much more dull colour, all of which seemed to terminate with the ileum.

The peritoneal coat of the small intestines, and particularly that of the stomach, were much inflamed, but no albuminous deposits were seen.

ON THE

USE OF ARSENIC

IN SOME

AFFECTIONS OF THE UTERUS.

By HENRY HUNT Esq.,
OF DARTMOUTH.

Communicated by Mr. PERRY.

READ MARCH 27TH, 1838.

In 1834, the following case, whose result first attracted my attention to the effects of arsenic on the uterus, occurred to me.

A woman, about forty years old, consulted me for a cancer of the uterus in a state of ulceration, accompanied by a profuse fetid discharge, and great suffering, from which she was rapidly sinking. I prescribed for her four drops of the liquor arsenicalis three times a day, gradually increasing the dose to ten drops, which she continued a fortnight, when the well known poisonous effects of that mineral presented themselves, and in the same proportion the pain in the womb subsided. The discharge, however, continued unabated; she recovered slowly from the effects of the arsenic, but up to the time of her leaving Dartmouth, which was nearly two months, she had no return of pain in the uterus. I never could ascertain how the case terminated, but conclude that it ended fatally.

The fact of the pain in the uterus of this poor woman being relieved, as soon as the arsenic affected her system, struck me forcibly, and recollecting that inflammation of the genitals occasionally follows its administration as a poison, I was induced to hope it might be useful in some disorders of those parts. I was further encouraged by Dr. Locock, to whom I related the preceding case, who told me that he had cured a lady of menorrhagia by arsenic, having recommended it to her for a disorder of the nose, being ignorant at the time that she was subject to the former disorder; she having neglected to mention it, considering it quite irremediable, as it had baffled the skill of every physician she had hitherto consulted.

The following cases, the results of my experiments, will shew that my hopes were not altogether unfounded.

Mrs. N., ætat. 42, was subject when young, to hysteria, but was otherwise strong and healthy. She continued well up to the time of her third pregnancy, about sixteen years ago, when she became so enormously distended, as to cause considerable anxiety, her size being afterwards accounted for by her being delivered of three children. Her recovery was slow; for many months she was unable to sit upright, and has never since regained her former strength, having been kept in a state of great debility by profuse menstruation. The discharge was not only too profuse, but continued eight or ten days uninterruptedly, and returned again at the end of a fortnight, or sooner, if she had any anxiety or

fatigue; and her debility was further increased by an irritable state of the bowels, which almost invariably came on three or four days previous to the menstrual period. Many methods of treatment had been tried by various medical men with little benefit, and that little only temporary. In the summer of 1835, I first gave her liq. arsenicalis (Ph. Lond.), in doses of four drops three times a day, with ten of the Tinct. Camphoræ comp., commencing immediately after being unwell. The result was most satisfactory, for she did not menstruate again until two days beyond the natural time, and when she did, the discharge continued only five days, and was not more in quantity than it ought to have been; neither did the diarrhœa supervene. She then left off taking the arsenic regularly; but for the three or four succeeding months, she took it again for a week previous to the menstrual period, since which she has continued regular, is stronger and less hysterical than she has been since her confinement.

Mrs. B. P., ætat. 34; married; of a delicate habit; has borne seven children, and has miscarried three times. Since the last confinement, which happened two years ago, she has menstruated too frequently and too profusely, and has been also weakened by leucorrhœa, having seldom, during the last year, passed three days together free from the menstrual discharge. Her bowels have also been much relaxed, her tongue red and shining, and she has been harassed by a troublesome cough, with much expectoration: her strength and flesh were so much reduced

as to make her case a very unfavourable one. I gave her a pill containing the twentieth of a grain of the arsenious acid, with a draught, containing Liq. Calcis ℥ss. Syrup. Sarsæ ℥iij. three times a day. She commenced taking the medicine on the 27th of September, 1837, and for three weeks there was no improvement, excepting that the bowels were less relaxed. On the 19th of October, the menstrual discharge ceased, and did not return until the 28th of November, when she menstruated naturally and for six days only. She continued taking the medicine one month longer, and has now regained her usual strength and flesh, her cough has almost ceased, and she has since menstruated at the proper time. This lady had previously consulted three or four medical men, without deriving benefit from their prescriptions.

Mrs. W. H., ætat. 42, suffered in her youth for many years from dysmenorrhœa and hysteria, but was otherwise well and strong, until about six years ago, when she was much reduced by a severe and obstinate diarrhœa, which yielded at length to the remedies administered, but not until her strength was so much exhausted that she could with difficulty walk across her room. This lady expresses herself so clearly, that I will give in her own words that part of her case which more particularly relates to the subject of this paper. After having given a description of her illness above referred to, she says, "It was certainly two years or more before I became irregular; I then began to be unwell every fortnight,

and continued so, violently, a whole fortnight. It was after this that I began to take the pills, (containing the same quantity of arsenic as those given in the last case,) which seemed at once to increase my appetite and give me a kind of energy, that made it much less irksome to move. When I had taken the pills about three months, my strength was much increased, and from the time that I began taking them, I gradually became more regularly unwell. I left off the pills some months and then began them again, in consequence of a return of weakness and of being again too often unwell, and they were certainly of great benefit to me." This lady has since continued well and is now capable of riding eight or ten miles on horseback, without much fatigue, and menstruates regularly.

Eliz. Stubbs, ætat. 17, menstruated, for the first time, at the age of 15, for a few months regularly, since which the discharge has returned too often, and for the last year it has continued almost constantly, and in such profusion as to debilitate her greatly, and to oblige her to leave her situation as a servant, although healthy in every other respect. I was consulted in August, 1837, and gave her the arsenic in pills, as in the two former cases, one three times a day. The discharge was arrested after she had taken the pills a fortnight, and returned at the proper time; since which she has continued to menstruate regularly, and has regained her strength. She took the pills six weeks.

Eliz. Locke, ætat. 36, unmarried, was strong and healthy until two years ago, when she was much exhausted by fatigue and loss of rest. From that time her strength has been gradually declining, which she attributes to the circumstance of her being unwell profusely for six or eight days at a time, with only a week intervening between the periods :—in other respects she is well. On the 16th November she commenced the arsenical pills, taking one three times a day. The discharge ceased two days afterwards, too early to be attributed to the effect of the medicine; after three weeks it returned, not, however, so copiously as before, and continued only five days. She has since only menstruated once, at the proper time, and has resumed her situation as a servant.

Eliz. Fox, ætat. 17, consulted my father in 1836, for a leprous eruption on the knees and elbows, for which he prescribed three drops of the liquor arsenicalis three times a day. At the end of three months her mother called on him, to thank him for not only curing her daughter of the eruption, but for making her regular, then mentioning, for the first time, that previously to taking the medicine, her daughter had menstruated much too frequently and profusely, which had gradually abated since she had commenced taking the drops; and that she was then quite well.

It is almost unnecessary to state that there was no inflammation or organic disease of the uterus of those females whose cases have been related, but the excessive flow of the uterine discharge appeared to be the

consequence of exhaustion, (except in the two younger girls,) although the exhaustion originated in the several individuals from different causes.

From the immediate and progressive improvement which succeeded the administration of the arsenic, the cessation of the menorrhagia may be fairly attributed to the action of that medicine, and its peculiar power is more clearly shewn in the first three cases, for in two, the disorder had previously resisted every remedy that had been given under the direction of very skilful physicians; and in the third, the immoderate discharge was arrested while taking the arsenic the first time, but returned soon after it had been left off, and was again immediately and permanently checked by resuming it.

The success attending the use of this remedy in menorrhagia induced me to give it in some other affections of the uterus, some examples of which are here annexed.

Mrs. Burne, ætat. 30, married, but never pregnant, was labouring under the following symptoms when she consulted me in June, 1837. A constant pain with heat, varying in severity, in the lower part of the sacrum, in the left groin, and under the pubes, and bearing down, which was much increased by walking, standing or sitting upright, by a costive state of bowels, or by the action of purgative medicine. She was easier in bed or reclining on a sofa; her urine was sometimes high coloured, at other times pale, her pulse rather quickened. On examination, per vaginam, the uterus was found to be

tender and rather tumid. She attributed her disorder to the menses having been suddenly checked by exposure to cold three years before. She had consulted many medical men, who had bled her generally and locally, and always with temporary relief; purgatives, opiates, the warm and cold baths, and numerous other remedies, having been employed without any lasting benefit.

Thinking this to be a case of chronic inflammation of the uterus, I confined the patient to her bed, and for six weeks kept her under the influence of a mild course of mercury with nitre and colchicum. While she remained in bed she was easy, but the pain returned with equal severity immediately on her leaving it and taking exercise. I then sent her home, and directed a pill, with $\frac{1}{20}$ of a grain of arsenic, to be taken three times a day, which she continued four months, at the end of which time the pain, which had gradually decreased after she had taken the pills six weeks, entirely ceased. She now attends to the active duties of a bakehouse, and only suffers pain about the time of her menstruation. This case may perhaps be considered similar to those described by Dr. Gooch as the irritable uterus.

Mrs. W., ætat. 44, married, a strong and robust lady, has borne five children, the birth of the last, about six years ago, was followed by hæmorrhage so profuse as to endanger life, to arrest which it was necessary to introduce the hand into the uterus, to remove the coagula, and to procure its contraction. This was followed by inflammation of the uterus,

which was with difficulty subdued; she was, when convalescent, necessarily much reduced in strength, and her recovery procrastinated by leucorrhœa. After a few months she menstruated, but for three or four days before the discharge came on she suffered acutely from neuralgic pain in the face. This regularly returned a few days previously to her being unwell, each time increasing in severity, until it became most agonizing, though in the intervals she was quite easy. To relieve this pain, I gave her five drops of the liquor arsenicalis three times a day, gradually increasing the dose as largely as it could be borne. She took it for three months with an occasional interval of a few days. The violence of the paroxysm was mitigated, but still it returned regularly for several months longer, although each attack became less acute than the preceding one. The medicine having become very repugnant to her, was discontinued for a few weeks, and only given in small doses for four or five days every month previously to her being unwell. This plan was pursued for several months after the pain had ceased, in consequence of her feeling a peculiar sensation in the cheek, which always preceded the paroxysm. During the period of her suffering so severely, there was no apparent deviation from health in the menstrual discharge. She remains well.

Although in this case there was no apparent disorder of the uterus to cause the attack of neuralgia, yet, when it is remembered that this organ suffered so

severely at and after delivery, that the pain came on regularly at the menstrual period, and that it was quite absent in the intermediate time, it may be fairly inferred that some irritation in the uterus was the cause of it, and further, that the arsenic removed it by overcoming that irritation. At the time when this lady was under my care, I was ignorant of the effect of arsenic on the uterus, but since my attention has been directed to it, I have relieved several ladies suffering in a similar manner, whose cases should be detailed, were it not that this paper would be extended to too great a length.

Dr. F. H. Ramsbotham, in his excellent Lectures on Midwifery, states that "It is occasionally observed, that the menses appear in particular persons very irregularly, sometimes occurring at the end of a fortnight, at others, not for five or six weeks; they are also irregular in regard to the time they continue flowing, and to the quantity produced at each period." This he considers only inconvenient, and that no means should be taken to regulate the return. The following case is one of that description, with the exception of the lady's having suffered much pain and general disorder when the menses did not return at the proper period.

Mrs. H., ætat. 34, was for many years irregular; the menses seldom returned too frequently, but generally at the end of five or six weeks, or even longer. When this happened, she had much pain in the loins, head, or chest, or under the sternum, but never simulta-

neously; sometimes it attacked one part, then suddenly quitting it, it attacked another, varying frequently during the day.

These erratic pains were more severe, the longer the return of the menses was postponed, but the instant they came on she was quite relieved. The menses seldom continued to flow regularly, but sometimes suddenly stopped, when the pain in one part or the other immediately returned. She took three drops of the liquor arsenicalis twice a day for three months in the summer of 1837, and at each succeeding period she suffered less, and the discharge has since returned quite regularly.

By examining the effect of arsenic when given in poisonous doses, its beneficial action in the foregoing cases may be somewhat explained, for it appears, according to the observation of Professor Christison, that the genital organs are affected if life is prolonged beyond three days after taking arsenic as a poison, in which case irritation in the other mucous passages succeeds or accompanies the signs of inflammation of the alimentary canal; and in his work on poisons, he states, at page 217, "In many instances, too, the urinary passages are affected, the patient being harassed with frequent, painful, and difficult micturition, swelling of the penis, and pain in the region of the bladder; or if in a female, with burning pain in the vagina and excoriation of the labia, but this does not happen unless life is prolonged beyond three days." At page 240, in a case related by Bachman, "the woman complained of burning of the fundament and

genitals, both of which were inflamed even to gangrene;" again at page 244, "In ordinary cases in which death is delayed till the second day or later, a considerable variety of diseased appearances has been observed; they are different changes of structure arising from inflammation of the alimentary canal, in the organs of the chest, and the organs of generation." At page 253, "the organs of generation are occasionally affected; in a case related in Pyl's collection, the inside of the uterus and fallopian tubes were inflamed."

Although inflammation of the inside of the uterus has been only observed in one case, yet it may be reasonably inferred that in cases mentioned by Professor Christison, where inflammation in the genitals had been so violent as to terminate in gangrene, inflammation of the uterus would have been observed, if that organ had been examined.

If the foregoing observations are correct, the benefit derived from this medicine may be explained by its acting on the mucous membrane of the uterus as a stimulant. It follows that the cases in which it would be given with the greatest advantage, are those in whom the disordered condition of the uterus had been induced and kept up by debilitating causes.

As it is frequently desirable to continue the use of this remedy for a considerable time, for large doses taken for a short time produce much distress without the desired effect on the uterus, the form in which it is most easily borne by the stomach should be selected, and I have observed that when it is given in pills

containing $\frac{1}{10}$ of a grain, it has produced less inconvenience than the common preparation, the liquor arsenicalis; I have therefore generally chosen that mode of giving it, and my patients have seldom complained of any unpleasant feeling from it, although in some instances it has been taken for many months in succession.

The stomach however does not become accustomed to it, as it does to many other remedies, so as to bear a gradual and continual augmentation of the doses; but on the contrary, the longer it is continued the greater is the inconvenience it occasions, so that instead of increasing, it is often necessary to lessen the quantity, after it has been taken some little time, or even to discontinue it for a week or two, and then resume it. Some individuals are much more sensible to its effects than others, but the most sensitive, by taking the pill immediately after meals, have been enabled to continue it as long as it has been necessary, while others can take two pills, or $\frac{1}{10}$ of a grain, three times a day for a considerable period, without any unpleasant effect.

I need scarcely remark that great care is necessary in making the pills, in order that the arsenic may be evenly divided.

I have often combined it with other remedies with manifest advantage, but I have selected the foregoing cases as they were cured by arsenic alone.

CASE

OF

EXCISION

OF

THE ENTIRE LOWER JAW;

WITH OBSERVATIONS.

By JOHN G. PERRY,

SURGEON TO THE FOUNDLING HOSPITAL, AND ONE OF THE SECRETARIES OF THE SOCIETY.

READ MARCH 27TH, 1838.

The following singular example of disease presented itself in a patient under my care in the St. Mary-le-bone Infirmary during the last year; and as it is, in some particulars, without a parallel in the records of surgery, or, as far as I am able to learn, in the museums of morbid anatomy, I trust the brief narration of its circumstances may not be unacceptable to the Society.

Maria Pitchford, who was in her 20th year at the time of her admission into the Infirmary, gave the following history of the progress of her complaint. At the age of fourteen, as nearly as she could recollect, she became affected with severe pain, which was attributed to rheumatism, of the right side of the face, affecting all the teeth on that side, and depriv-

ing her of rest and of the power of mastication. The pain shortly afterwards extended to the other side also; but even then, according to the account given of herself by the patient, there existed neither swelling nor redness of the parts. In the course of a few months, however, the lower part of the face was observed to increase in size, a change which gave her no uneasiness, as the pain and inability to masticate were diminished in proportion as it advanced.

The patient continued for several years, during this stage of her complaint, to follow her ordinary employment, that of a household servant, until she was compelled to abandon it by a fresh accession of pain, accompanied by inflammation, which she ascribed to having taken cold. Previously to this attack the lower part of the face had become greatly increased in size, but was hard and insensible; its condition, however, now became materially altered, it was red, painful, acutely sensible to the slightest pressure, and throbbed severely. Matter at length formed, and discharged itself at many apertures, to the partial relief of the sufferings of the patient.

Such had been her condition during many months when she came under my care early in the last year. The case then presented the appearance of necrosis in the advanced stage; there were several sinuses opening around the chin, discharging tolerably healthy pus, the dead bone was evidently encased in a deposit of recent formation, which, at that time, there was no ground for supposing to be dead also. No treatment seemed then to be required, beyond the ordinary atten-

tion to the patient's general health, while nature should be occupied with the curative process of separation. After a time, however, finding that no change seemed to be going on, I deemed it expedient to explore the condition of the bone by enlarging the aperture of one of the sinuses, when the cause of the tardy advance of the cure became apparent, the entire case of new bone being found to be dead, and to have separated in a great measure from the periosteum, which membrane was manifestly in a diseased condition.

The removal of the bone by artificial means being now the only course to be pursued, I determined upon the operation without any longer delay; and that no larger wound might be inflicted than was absolutely requisite, I resolved to divide the bone into three portions.

The patient being laid upon her back as nearly in the horizontal position as the feeling of suffocation would permit, an incision was made along the basis of the jaw from a short distance in front of the right masseter muscle, to the corresponding point on the left side, in order to avoid the facial arteries, and to include the orifices of two of the principal sinuses. The bone thus exposed, was divided, by a saw and cutting forceps, as near as possible to the angles of the wound, and the insulated portion being removed, the wound was lightly dressed. On the following day, the portion remaining on the right side, which had somewhat descended from the loss of the support of the central part, was removed without difficulty.

The patient experienced much relief from these operations, and the suppuration diminished greatly. After an interval of three weeks I proceeded to remove the remaining segment, which adhered rather more firmly, but by means of some careful manipulation, was separated without materially enlarging the wound.

As might have been expected, from the long continuance of the disease, and the consequent separation of the parts, little hæmorrhage followed these several operations; in each of them great care was taken to avoid opening the mouth by cutting through the lining membrane, and the teeth were, when practicable, left in the gum, in the hope that when consolidation should take place, they might be found useful. The wound healed without difficulty, and the patient was discharged in a few weeks, to follow her employment.

I have seen her frequently since her removal from the infirmary: the last time, three days ago. She is able to masticate solid food by the aid of the tongue, which rubs the morsel against the upper teeth; but as there is no reproduction of bone, the lower teeth are almost useless, for though they are firmly retained in their situation by some solid structure of new production, the consistence of that support has not been sufficient to resist the contraction resulting from the healing of the wound; consequently the circumference of the arc formed by the lower teeth is so much reduced in extent, as no longer to correspond with that of the upper.

The face is less deformed than might have been

anticipated after the removal of so considerable a part of its skeleton, and the deformity seems to be diminishing by the depression of the chin, attributable, perhaps to the continual action of the mylo-hyoideus, genio-hyoideus, and other muscles of the larynx.

From the above history there can, I think, be no doubt that the disease was of very long standing, or that it had, in the first instance, the ordinary characters of necrosis. The anomalous position of the teeth of the permanent series * obviously indicates the existence of diseased action prior to the æra of the permanent dentition, the deciduous teeth, as far as can be learned from the present appearance of the specimen, being quite regular and natural.

The occurrence of severe pain about the 18th year, with the subsequent enlargement and suppuration of the part, points out no less clearly the æra of the destruction of the vitality of the *new* bone, which having been laid down in the usual manner as a case surrounding the old, and originally destined to supply its place, seems to have participated, at this period, in the destructive process.

That accidents analogous to that above related do not more frequently occur in cases of necrosis, especially in a bone exposed to such constant motion as the jaw, is attributable probably to the circumstance that the epiphyses forming the joints are very rarely involved in the disease. In ordinary cases, when the shaft of a bone perishes, the epiphyses are as firmly held together by the new bone enclosing

* See Plate VI. at the end of the Volume.

the sequestrum, as they had originally been by the shaft of the old. The diseased parts are maintained in a state of rest, undisturbed by the motions of the joints at either extremity, until Nature's processes are completed, and the sequestrum is finally absorbed, expelled, or extracted by art.

While the case of Maria Pitchford was under treatment there were also in the Infirmary two other instances of necrosis of the jaw, in which the affection was, as usual, limited. In one of these the coronoid process, as far as the junction of the ramus with the basis of the jaw, in the other the alveoli of five teeth, with a part of the basis of the bone, were alone affected; and both these segments readily separated and were taken away through the mouth; the restoration in both instances being complete, and the process of mastication having in neither been interrupted during the progress of the cure. Such would, probably, have been the case in the instance which forms the subject of the present communication, but for the circumstance of the articular extremities of the bone having been involved in the destructive process.

Great James Street, Bedford Row.
February, 1838.

ON

INCREASED THICKNESS OF THE PARIETES

OF ONE OF THE

VENTRICLES OF THE HEART,

WITH

DIMINUTION OF ITS CAVITY.

By GEORGE BUDD, M.B, F.R.S.

FELLOW OF CAIUS COLLEGE, CAMBRIDGE, AND PHYSICIAN TO THE SEAMEN'S HOSPITAL, DREADNOUGHT.

COMMUNICATED BY MR. PERRY.

READ APRIL 10TH, 1838.

UNNATURAL thickness of the parietes of one of the ventricles of the heart, with diminution of its capacity, was first distinctly noticed, as one of the forms of hypertrophy of that organ, by M. Bertin, in 1811, and was by him designated "concentric hypertrophy." His observations have since been corroborated by those of other pathologists, and the existence of this condition has been generally acknowledged.

M. Cruveilhier, however, refuses to admit this form of hypertrophy, and gives a different explanation of the appearances which have sanctioned the designation, concentric hypertrophy. He says, "the

facts, which I have had occasion to observe, do not allow me to admit concentric hypertrophy: the obliteration of the cavity, and the proportionably increased thickness of the parietes, appear to me the result of the mode of death. The hearts of all those whom I have had an opportunity of examining, who died by the executioner, have presented this double phenomenon in the highest degree; the parietes of the ventricle were in contact at all points. I have made the same observation with regard to other persons who died a violent death. The hearts, concentrically hypertrophied, of the authors I have just quoted, (MM. Bertin and Bouillaud,) appear to me to be hearts, more or less hypertrophied, which death surprised in all their energy of contractility."*

The dissent of so respectable an authority from the opinions of all physicians who have recently written on diseases of the heart, who have not only considered concentric hypertrophy as a pathological condition, but have even agreed in ascribing to it a peculiar catalogue of symptoms, has induced me to publish some cases of this affection that have fallen under my own notice, and to review those that have been recorded by authors, for the sake of ascertaining whether it must be considered a disease, or whether we must conclude, with M. Cruveilhier, that it is merely a passing condition of the ventricle.

* Dictionnaire de Méd. et de Chir. pratiques. Art. Hypertrophie.

*CASE I.**

A man, 21, addicted to spirituous liquors, at sea since the age of 14, was admitted at St. Bartholomew's Hospital with cerebral symptoms, (delirium alternating with coma,) on the 19th of March, 1836. His breathing was somewhat stertorous and hurried; his pulse very feeble and rapid. There was no œdema or dropsy. He was reported to have had severe cough, with pain in the chest, which lasted some days, about a week before his admission. Death occurred in profound coma on the 21st.

Inspection, eighteen hours after death.—Heart larger than natural; internal and external membranes healthy; valves healthy; length of the left ventricle, (which formed almost the whole mass of the heart,) measured by a string wrapped on it, from the base to the apex, $5\frac{1}{2}$ inches. A transverse section of the ventricle was made at a distance from the apex of rather more than $\frac{1}{3}$ of its length; the thickness of the parietes of this section varied from 1 to $1\frac{1}{2}$ inch; the thickest portion corresponding to one of the columnæ carneæ, which columna was nearly as large as the top of my fore-finger; the thickness of the parietes near the base from $\frac{6}{8}$ths to $\frac{7}{8}$ths of an inch. The cavity was not large enough to hold the second phalanx of the thumb; it was almost filled by the co-

* For the notes of this case during life, and the heart of the subject, I am indebted to my friend, Mr. Firth.

lumnæ. The mitral orifice was free; the tendinous threads of the valve small and delicate, bearing no proportion to the massive state of the pillars. The right ventricle, perfectly natural in capacity and in the thickness of its parietes, reached to within $\frac{3}{4}$ths of an inch of the apex. Both auricles natural; the foramen ovale closed; the aorta, throughout, very small; its inner circumference, just above the valves, two inches. In this portion were some yellowish spots, particularly near the points of union of the sigmoid valves, which were thin and small. The heart, in its opened state, was put to macerate; no force was applied to extend it. At the end of some days, on being folded up, it was found to have dilated very considerably, so that the left ventricle could not then be said to be smaller than natural.

CASE II.

A negro, 25, in good nutrition, who had been much exposed to cold, and whose toes were frost-bitten, was admitted into the Dreadnought, January, 1838. He presented febrile symptoms, but none that led us to suspect disease of the heart, and died unexpectedly a few days after admission. No information could be obtained from him, and no notes of his case were taken.

Inspection.—There was no œdema or dropsy. The heart, which was larger than natural, presented the appearance of concentric hypertrophy

of the left ventricle. The parieties of this ventricle were more than an inch in thickness; the cavity quite obliterated, but, by the forcible introduction of the fingers, I succeeded in dilating it to the usual dimensions. The point of the right ventricle more than an inch from the apex of the heart. No dilatation of the other cavities. The external and internal membranes of the heart, and the valves, quite healthy. No malformation. No disease of the aorta.

CASE III.

A woman, aged 60, affected with senile gangrene of the left foot, and acute inflammation of the left knee joint, died in the Middlesex Hospital, on the 14th of November, 1836, and was inspected on the following day.

Great emaciation; no œdema or dropsy. Heart not larger than natural. A milky spot of the size of a shilling on the pericardium, which was otherwise healthy, and which contained a small quantity of serum. The cardiac veins were very serpentine. The left ventricle appeared solid; when cut into, the cavity could scarcely hold an almond; the parietes were very thick. No dilatation of the other cavities, or thickening of their parietes. All the valves healthy. The arteries much incrusted; the aorta rather large: the left vertebral arose from the aorta between the carotid and subclavian.

*CASE IV.**

A man between 60 and 70, tall and thin, subject to chronic cough, fell down in apoplexy, followed by paralysis and other cerebral symptoms, on the 31st of March, 1836. On the 1st of April, he was bled to ℥ xvj. On the 2nd, the pulse was noted as rather quick and unsteady; the breathing stertorous. He died on the 3rd.

Inspection, twenty-four hours after death.—No œdema or dropsy. Cavity of the left ventricle so much contracted as only to admit one finger; its external paries, about the middle, thicker than the length of the second phalanx of the thumb. Right ventricle perhaps slightly dilated. Other cavities normal. Orifices and valves healthy. Depositions beneath the internal coat of the aorta; arteries of the brain extensively diseased. A coagulum in the right lateral ventricle proceeding from the corpus striatum, &c.

In the authors that I have consulted, I have met with fifteen cases of concentric hypertrophy. Of these, four presented very little, if any, obstacle to the circulation from valvular disease, and may, therefore, be classed with those I have just related; six offered considerable obstruction to the circulation from thickening and cartilaginous induration of the valves, and will be subsequently considered; in the remaining five, there were evident signs of congenital malformation of the heart, and I shall consequently refer them to a group apart.

* Recorded by my friend, Dr. Johnstone.

The case that I shall first mention is a very striking one: it is recorded by Laennec.

CASE V.[*]

A man aged 67, tall, pale, and thin, entered the hospital the 22d of April, suffering from intense frontal headache; his tongue was coated, and he was considered as labouring under a bilious affection without fever. The pulse was natural, the breathing perfectly free, and nothing, says Laennec, led me to suppose that this man had a disease of the heart; he was considered infirm, rather than ill, and was on the point of leaving the hospital, when, on the 20th of May, a fresh group of cerebral symptoms made their appearance, and the patient died in the night of the 24th. As late as the 22d of May, the pulse was quite natural in frequency, development, and rhythm.

Inspection, thirty-six hours after death.—Body, pale and thin. The heart exceeded in volume both fists of the subject; the right ventricle was small, its parietes thin, and it had the appearance of having been made (pratiqué) in the substance of the left. The left ventricle presented a cavity capable, at most, of containing an almond stripped of its shell; the greatest thickness of the parietes 1½ inch, the least thickness 1 inch, except towards the point of the heart, where it was at most two lines. One of the aortic valves presented three or four small excres-

[*] Laennec, Obs. 54.

cences, analogous to venereal warts of fleshy consistence, and very adherent to the valve. The arch of the aorta, dilated to the size of a moderate apple, was incrusted with osseous laminæ. There was also an aneurism of the abdominal aorta, cerebral congestion, and an infiltration of transparent gelatinous serum into the cellular tissue of the pia mater.

*CASE VI.**

A man aged 60. Death by apoplexy, two days after the attack. Beating of the heart very forcible. Pulse 100, small and narrow. No mention of œdema or dropsy.

Inspection.—The heart larger by a good third than natural; round, plump, blunt at the point. The left ventricle enormously hypertrophied; its cavity can scarcely hold the fore-finger; the greatest thickness of its parietes 13 lines; the columnæ carneæ exceedingly robust. The septum, 9 lines in thickness, projects into the cavity of the right ventricle, whose capacity is about natural; the greatest thickness of its parietes 3½ lines. The mitral valves thickened, and spotted with yellow plates. The tissue of the heart of a bright red. The origin of the coronary arteries fibro-cartilaginous. The commencement of the aorta offers some yellow points and spots, rudiments of ossification. The arteries of the brain ossified. Two hæmorrhagic collections in the brain.

* Bouillaud, Obs. 128.

*CASE VII.**

A woman, 40. Palpitations at intervals for eight years; occasionally accompanied, during her stay in the hospital, with sense of suffocation. Hemiplegia. Death occurring during erysipelas of the face, the palsy having existed about four months.

Pulse regular; not full, but hard and strong; pulsation of the left ventricle strong, concentrated, and dull. No œdema or dropsy.

Inspection.—Heart double the size of the fist of the subject. Left ventricle extremely robust; its parietes an inch thick in the middle, the thickness diminishing towards the base and apex; its cavity very sensibly contracted. Two auricles and right ventricle very nearly normal. Orifices healthy. Aorta small, and spotted with earthy concretions. Softening of several parts of the brain.

CASE VIII.

A woman, 52, tall and very thin, reporting herself habitually asthmatic. No other history. Death the day after admission.

Pulse noted 112, tolerably full and soft. Pulsations of the heart tolerably strong, accompanied by the usual double sound. Distension of the jugulars, particularly of the left. No œdema or dropsy.

Inspection.—Heart round and blunt. Milky spots on the upper and anterior part of the right ventricle. Thickness of the parietes of this ventricle very great,

* Bouillaud, Obs. 118.

especially under the spots, where it was more than four lines. Columnæ carneæ numerous, and forming a close network. Cavity of the right ventricle scarcely admitting the fore-finger. Cavity of the left, perhaps a little less capacious than natural. Other cavities not remarkable. Orifices and valves natural. Aorta, in its pectoral and abdominal portions, sprinkled with fibrous or fibro-cartilaginous laminæ. Grey hepatization of the right lung; emphysema of the left *.

Here, then, we have eight cases, in which the appearances of concentric hypertrophy existed without complication of any considerable disease of the valves. In one of these only was any irregularity of the pulse noticed; in none was there dropsy; and in none, if we except Dr. Johnstone's case, in which there was a questionable dilatation of the right auricle, was there any dilatation of the right cavities. From this we may infer that the affection of the heart, in these cases, offered no considerable obstacle to the circulation through it. For when much obstacle exists, at least on the left side of the heart, there is generally intermittence or irregularity of the pulse, and almost invariably dilatation of the right cavities and dropsy.

(Of forty-one cases recorded in the works of Bouillaud and Corvisart, in which either the aortic or mitral orifice was contracted, exclusive of cases in which there was congenital malformation of the heart, twenty-seven presented intermittence or irregularity of the pulse; there are only five in which some degree of

* Bouillaud, Obs. 122.

dropsy was not noticed, and only three in which neither of the right cavities is said to have been dilated.)

By the absence, then, of these three conditions in the cases of concentric hypertrophy, we are justified in concluding that this affection, in the cases in which it has been observed uncomplicated with an obstruction at the valves, offered no obstacle to the circulation through the heart*.

But how can we reconcile this with the smallness of the cavity in these cases? It is impossible to conceive that a left ventricle, which could scarcely hold an almond, should offer no obstacle to the circulation through the heart. Yet in this very case, the day before death, the pulse was quite natural in frequency, development, and rhythm, and we have the word of the accurate Laennec, that there was no symptom of disease of the heart.

In another very marked case, the pulse was noted as tolerably full and soft. None of these patients died of disease of the heart; and in all, the symptoms which could have led one to suspect cardiac disease were slight, and no other than those which indicate simple hypertrophy †.

* This conclusion is in opposition to the opinion expressed by physicians who have noticed concentric hypertrophy, who have agreed in assigning to it the same symptoms as those which characterize contraction of an orifice.—(See Bertin, p. 359. Dr. Hope, Art. Hypertrophy, Cyclopedia. Audral, Tom. I. ch. 2.)

† In the treatise of M. Bouillaud is recorded a case of simple hypertrophy of the left ventricle, (Obs. 113,) and one in which the left ventricle was slightly dilated and greatly thickened,

We must then, I think, conclude that in the cases which I have related, there was not really a contraction of the cavity during life; but, to use the terms of M. Cruveilhier, that they were hearts, more or less hypertrophied, which death surprised in a state of contraction; and this conclusion becomes imperative, when we consider that, in the first case, the ventricle became relaxed to its ordinary capacity after the heart had been a few days in maceration; and that, in the second, the same effect was produced by the forcible introduction of the fingers.

Another inference from the preceding cases is, that enormous hypertrophy, unaccompanied by dilatation or by disease of the valves, does not produce any of the symptoms characteristic of an obstacle to the circulation through the heart. The true causes of these symptoms, when they exist in the heart, appear to be—

1. An increase in the volume of a cavity, relatively to the area of its discharging orifice, which renders necessary, as is evident from mechanical considerations, the exertion of greater force by the parietes to propel an equal quantity of blood with the same velocity.

2. Any obstruction from thickening or insufficiency of a valve.

3. A want of power in the parietes of a ventricle

(Obs. 116,) neither of them presenting any obstacle at the valves. In these there was no dilatation of the right cavities; no dropsy; there were depositions in the arteries, and dilatation of the orifice of the aorta in both; cerebral apoplexy in both.

to empty the cavity, from deficiency of energy, as in cases of chlorosis, &c.

In the details into which I have entered with respect to these cases, will be observed some points in common, which seem to indicate the circumstances favourable to this appearance of concentric hypertrophy.

1. *Age.*—Six of the eight cases occurred in persons who had passed the meridian of life; four in persons who had reached the age of sixty or more; and, with one exception, (Case 1,) the most marked cases occurred in the oldest persons. It is probable that the influence of age depends on its being favourable to hypertrophy. It appears from the researches of M. Bizot, published in the 1st vol. of Mémoires de la Société d'Observation, that the average thickness of the parietes of the heart increases up to the latest periods of life.

2. *Diseased Arteries.*—In six of these cases, there were considerable incrustations of the lining membrane of the arteries. This condition, by the resistance from friction which it offers to the course of the blood, is also a cause of hypertrophy.

3. *Smallness of the Aorta.*—This was met with in two cases (1 and 7). It occurred, with one exception, in the youngest persons, and seemed to make up for the influence of age and diseased arteries in producing hypertrophy.

The two preceding circumstances, which I have mentioned as favourable to hypertrophy, may be supposed to conduce rather to dilatation; but dilatation is almost always accompanied by hypertrophy, and an

obstacle, whose general tendency is to produce dilatation with hypertrophy, may be the occasional cause of hypertrophy without dilatation.

(In the treatise of M. Bouillaud there are, exclusive of cases of congenital malformation, fourteen cases in which the aortic orifice was contracted from disease of the valves; in twelve of these cases there was dilatation of the left ventricle; and in the remaining two, hypertrophy without dilatation.)

4. *Emaciation.*—The subjects of four of the eight cases were noticed as being thin. The smallness of the quantity of blood may reasonably be supposed to have had some influence in producing the appearance in question; and this supposition is sanctioned by the fact noticed by M. Jackson, in his report of cholera in Paris, in 1832, and which my own experience has recently confirmed, that the hearts of persons who die of this disease often present the appearance of concentric hypertrophy, and by the observation of M. Cruveilhier, to which I have before alluded, with respect to the hearts of persons who die by the guillotine.

5. *Mode of death.*—In four at least of these cases death occurred from apoplexy.

Let us now proceed to consider the six cases in which the concentric hypertrophy was accompanied by considerable valvular disease.

In the first, the mitral valve was thickened, and the leaf corresponding to the aortic orifice fibro-cartilaginous, but the valve was moveable, and completely closed the orifice, which was free. Concentric hypertrophy of the left ventricle *.

* Bouillaud, Obs, 119.

In the second, the mitral valves were shrivelled, and slightly cartilaginous; there were warty growths on the aortic valves. Concentric hypertrophy of the left ventricle; no dilatation of the right side; no dropsy *.

The two preceding cases seem to favour the common hypothesis, that contraction of an orifice has a tendency to produce contraction of the cavity before it in the course of the circulation †.

In the third, there was cartilaginous inclination of the mitral and aortic valves; concentric hypertrophy of the right ventricle ‡.

In the remaining three, there was concentric hypertrophy of both ventricles.

In one of these, (Case 4,) the mitral valve was generally thickened; fibro-cartilaginous in many points; not sensibly deformed; the aortic valves were a little thickened, the tricuspid slightly thickened, especially at their extremities, but well formed and moveable §.

Case 5.—The mitral valve was a little shrivelled, thickened, and fibro-cartilaginous, but not much deformed. The tricuspid valves thickened, slightly cartilaginous at the free edge, well formed ||.

Case 6.—The mitral valves fibro-cartilaginous; no affection of the tricuspid noticed ¶.

* Laennec, Obs. 50.

† Corvisart, Trans. p. 86. Med. Gaz. Vol. III. p. 371, Dr. Latham.

‡ Bouillaud, Obs. 123. Recorded by M. Bertin.

§ Bouillaud, Obs. 65.

|| Bouillaud, Obs. 133.

¶ Bouillaud, Obs. 134. Recorded by M. Bertin.

If in these cases it is not easy to shew that the affection did not exist during life, it is at least obvious that its origin cannot be explained on the hypothesis of an obstacle behind the cavity; for if the concentric hypertrophy of the left ventricle depended on the obstacle at the mitral valves, on what did that of the right ventricle depend? Surely not on the obstacle at the tricuspid valves, which were very slightly affected, and that only in two of the cases. Besides, observation teaches us, that contraction of an orifice has a very slight, if any, influence in producing contraction of the cavity *before* it in the course of the circulation.

(In the works of Bouillaud and Corvisart, there are twenty-five cases recorded of contraction of the mitral orifice, accompanied in most cases, certainly, by disease of the aortic valves; and in these twenty-five cases, contraction of the left ventricle did not once occur.)

In the last four cases, in which there was cartilaginous induration of the mitral or aortic valves, and concentric hypertrophy of the right ventricle, it seems probable that such an anomalous coincidence arose, not from a permanent, but from a temporary condition of the ventricle, which, in such cases, is almost universally dilated.

All the subjects in this category died of disease of the heart.

If we compare the cases in which the affection was unaccompanied by considerable obstacle from disease of the valves, with those in which such obstacle ex-

isted, we shall find that, in the first, there was no dropsy, no very evident signs of disease of the heart, and that neither of the patients died of a cardiac affection; that, of the others, there was dropsy in five cases; evident signs of the disease of the heart in all; and the disease of the heart the immediate cause of death in all. Now, the appearances of concentric hypertrophy were not more manifest in the second series than in the first.

If, then, the concentric hypertrophy observed in the second series was identical with that in the first, which it is fair to conclude for most of these cases, we must infer that the symptoms of disease of the heart, in the cases of the second series, did not result from the concentric hypertrophy, but from the valvular disease that accompanied it, and which was of itself, too, sufficient to account for such symptoms*.

The cases in which the appearances of concentric hypertrophy were observed, in conjunction with congenital malformation of the heart, still remain for our consideration.

In Case 1. A yellow, elastic membrane, having, at its centre, a permanent and oval aperture of $1\frac{1}{2}$ lines in diameter, represented the pulmonary valves; there were only three pulmonary veins. The right ventricle could scarcely hold the second phalanx of the thumb, its cavity being nearly obliterated by concen-

* It is from not having distinguished the cases in which it occurs in conjunction with diseased valves that some physicians have considered pericarditis as a cause of hypertrophy.

tric hypertrophy of the parietes, which, at the base, were nearly an inch in thickness *.

Case 2. At a small distance above the pulmonary valves, was a sort of diaphragm, perpendicular to the direction of the vessel, having an opening of about 2½ lines in diameter. There was communication between the ventricles by a hole, perfectly round, 2 lines in diameter: the cavity of the right ventricle was very small, almost obliterated towards the point, to the height of two inches; the thickness of the parietes, partly the result of the development of the columnæ carneæ, was from 8 to 10 lines †.

Case 3. A sort of diaphragm, having at its centre a hole perfectly circular, of 2½ lines in diameter, represented the pulmonary valves; the foramen ovale was open, and 4 lines in diameter. The right ventricle could just hold a pigeon's egg, and the thickness of its parietes varied from 11 to 16 lines ‡.

Case 4. A child three years old. It was necessary to use a probe to penetrate into the pulmonary artery, so great was the contraction of its orifice; the foramen ovale admitted a female sound; there was free communication between the ventricles, and an anomalous distribution of the arteries. The cavity of the right ventricle was contracted, and its parietes of considerable thickness §.

Case 5. A child who lived thirteen days. The

* M. Burnet. Obs. 77, of Bouillaud.

† Obs. of Louis. Obs. 76, of Bouillaud.

‡ M. Bertin. Obs. 75, of Bouillaud.

§ Corvisart, Trans. p. 261.

pulmonary artery was quite obliterated at its origin, and the foramen ovale was very large, so that all the blood of the right auricle passed immediately into the left. The right ventricle was almost a solid mass of flesh; there was scarcely any cavity. The ductus arteriosus appeared to be a branch of the aorta *.

In all these cases, then, there was a congenital obstruction at the pulmonary orifice, and in most of them there was, certainly, concentric hypertrophy of the right ventricle. In the last of these cases, the circumstance of the child's dying at the age of thirteen days, proves that in it the concentric hypertrophy was also congenital; and as most of the other cases presented characters similar, and differing only in degree, and as, in all, there was a malformation, evidently congenital, causing obstruction at the pulmonary orifice, the tendency of which would be to dilate the right ventricle, unless that ventricle were originally small in proportion to the pulmonary orifice, we must, I think, conclude that, in these cases, the concentric hypertrophy was also congenital.

With these may be classed the following case, which came under the observation of Dr. Sweatman; of a child who lived nine days, and during its life experienced great difficulty in breathing.

The left ventricle is almost a solid mass of flesh; the aortic orifice is so contracted as scarcely to admit the top of a probe; the left auricle is very small, with the exception of the auricular appendix, which is dilated. The foramen ovale is open. The cavity

* Dr. W. Hunter. Burns, p. 25.

of the right ventricle, which forms entirely the apex of the heart, is very large; its parietes not thickened. The cavity of the right auricle very large; its parietes thin. The tricuspid valves are replaced by a single membrane, which does not nearly close the orifice; there are two pillars attached to this membrane, one of them without any chordæ tendineæ. There are no pulmonary valves; the pulmonary artery is very large; the ductus arteriosus equal in volume to the aorta, at its junction with it.

In this case, the circulation was carried on almost wholly by the right ventricle, and that with very little assistance from the valves; the general circulation being supplied through the ductus arteriosus.

The preceding cases appear sufficient to prove that concentric hypertrophy of one of the ventricles of the heart, with obstruction at its discharging orifice, may exist as a congenital malformation, and that, in cases in which there is an extraordinary passage for the blood, through the foramen ovale or the ductus arteriosus, or by the communication between the ventricles, the natural thickness of the parietes may be increased five or six times, or even more; and that, generally, the right is the ventricle so affected.

The right auricle was much dilated in all these cases, except in that by Dr. Hunter, in which its condition was not mentioned. In Case 1, it was larger than the fist of an adult; in Case 4, as large as the rest of the heart.

The respective ages of the subjects of these cases are 7, 25, 57, and 3 years; 13, and 9 days; so that

with one exception, all these patients died young. The circumstances which I have just mentioned, establish important distinctions between these cases and those of the former categories, in which the affection occurred most frequently on the left side, and generally in persons advanced in life, and where the parietes were never much more than doubled in thickness.

Recapitulation.—I. That there was no permanent diminution of the cavity during life, in the cases recorded of concentric hypertrophy of one of the ventricles unconnected with valvular disease, may be inferred from the following circumstances:

1. That similar appearances have been observed by M. Cruveilhier in the hearts of persons who died by the guillotine; and, by Mr. Jackson and others, in subjects whose death had been caused by cholera.

2. That in these cases the symptoms of cardiac disease were slight, and no other than those which indicate simple hypertrophy; and that there was no intermittence or irregularity of the pulse, no dilatation of the right cavities or dropsy; symptoms of obstacle to the circulation through the heart, which must have occurred had the cavity during life been so small as it appeared to be.

3. That, in two of the cases, the cavity was restored, by mechanical means, to its normal size; and that in none was there any obstacle behind it, by which its permanent diminution could be explained.

4. That the supposition of increased strength of the parietes with diminution of the cavity, and that,

too, relatively to the area of its discharging orifice, is opposed by the mechanical considerations by which we account for the almost constant occurrence of hypertrophy in cases of dilatation.

II. In the six cases complicated by extensive valvular disease, the diminution of the cavity cannot be explained by the hypothesis of an obstacle behind it; and, in some of these cases, the existence of an obstacle before it renders it highly probable that this diminution was merely a passing condition of the ventricle: and, as the appearances of concentric hypertrophy were not more marked in these cases than in those of the former category, and as the symptoms of obstacle to the circulation, observed in these cases, were such as would result from the diseased valves alone, we cannot admit the existence of concentric hypertrophy in the category we are now considering.

III. Concentric hypertrophy of a ventricle, in a high degree, with obstruction at its discharging orifice, and an extraordinary passage for the blood, occasionally exists as a congenital malformation, and, in most cases, the right is the ventricle so affected.

IV. Hypertrophy of the heart, to whatever extent it exists, when it is exempt from dilatation of the cavities, and from disease of the valves, does not produce any of the symptoms of an obstacle to the circulation through the heart.

Bedford Place,
April, 1838.

HISTORY

OF

A CASE

OF

POPLITEAL ANEURISM;

WITH OBSERVATIONS.

BY SAMUEL HADWEN,

HOUSE-SURGEON TO THE LINCOLN HOSPITAL.

COMMUNICATED BY MR. QUAIN.

READ FEBRUARY 27TH, 1838.

THE following case occurred in the private practice of Mr. Hewson, surgeon to the Lincoln Hospital, to whose kindness I am indebted for the opportunity of observing it through its interesting course, and for permission to give it publicity.

July 16th, 1837.—John Asman, æt. 23, married, of fine muscular development, and possessed of great physical strength, was seized, about three months ago, with pain in his right leg and round the knee, followed by swelling. Formerly he was porter to a wine merchant, but had latterly been employed in a flour-mill; in both situations he was subject to violent exertions, in lifting and carrying heavy weights. His general health, with the exception of

a severe attack of rheumatism, which he had some years ago, had been remarkably good. The present affection, which he considered rheumatic, had never required the discontinuance of his employment, and he relinquished it at this time rather in compliance with the directions of his medical adviser, than from any inability to pursue it.

The right calf was much larger than the left, and at the lower point of the popliteal space was a well defined tumour, as large as an orange; on each side and below this was a more diffused tumefaction, merging into the gastrocnemial swelling, and not to be distinguished from it. There was distinct pulsation, synchronous with the heart, and clear bruit in the swelling, especially at the inner side of the calf. Pressure upon the femoral artery suspended the pulsation, rendered the tumour soft, and diminished its size. The heart and arterial system, examined with the stethoscope, appeared perfectly healthy. It was stated that the calf of this leg had been for some years decidedly larger than the other.

July 18th. Mr. Hewson placed a ligature upon the superficial femoral artery at the margin of the sartorius muscle. Before the patient was removed from the table, it was observed that the aneurismal tumour was as large as ever, and the tension greater than it was before the application of the ligature; there was, however, no return of pulsation. He suffered very severe pain, for a few seconds after the ligature was tightened, down the leg, and a slight irregularity of the pulse, not amounting to an inter-

mission, could be occasionally but infrequently perceived.

An hour after the operation, no pulsation could be perceived in the tumour; but after three hours more it had returned with some force. Twelve hours after the operation the tumour did not appear quite so large as it had been, and was of the natural temperature; it was, however, deemed expedient to envelop it in flannel. There was a regular, but indistinct pulsation in the tumour, which was not synchronous with the pulse.

19th. Was quite comfortable, and the leg and foot were warm. The integument over the tumour was yellow, tense and resistant; when the hand was applied an indistinct but feeble pulsation could be perceived, and with the stethoscope an obscure, whizzing, prolonged murmur was heard.

24th. No reduction of the tumefaction and tension of the calf. During the night, considerable pain in the knee.

27th. Pulsation not perceptible in femoral artery below the ligature, but distinct in tumour at the ham, which was still hard and resisting. Not the slightest bruit could be heard in it by means of the stethoscope. The leg from the knee to the toes was beginning to assume an œdematous character, and had attained a greater size than it had before the operation; round the widest part at the calf, its circumference was eighteen inches. The incision had perfectly healed by the first intention, except at the point where the ligature projected. The heat of the

leg was great, and at times he was subject to very great pain, beginning in the ham, extending to the knee, and proceeding down the leg, quite as severe as that he suffered before the application of the ligature. Frequent and profuse perspirations, attended with a sinking sensation, and depression of spirits.

28th. The superficial veins of the leg were distended and the œdema increased. The skin over the sac more yellow than it had been. The paroxysms of pain, though less frequent than before the operation, increased in severity.

29th. The attacks of pain still more severe. Temperature between the toes of each foot 101° Fahr.; at the external surface of the calf, which was in contact with the bed, 102°; the same part of the unaffected leg, 98°. On applying the fingers to the middle of the thigh we discovered a pulsation, and with the stethoscope traced a distinct arterial bruit along the inner side of the thigh in the course of the artery, from about three inches above the knee to the groin, least audible at the lower part, and gradually becoming more loud to a little above the ligature, where it was very strong and distinctly heard. The integument over the tumour in the ham had a blush of inflammation upon it.

30th. Had been free from pain since the previous afternoon. There was a slight diminution of the shining and blush upon the integument. The bruit along the course of the femoral artery was still audible, but we could not find any pulsation. Pressure

upon the artery at the groin completely suspended the pulsation, recognizable in the sac, and produced some decrease of its bulk; pressure about the middle of the thigh, where the bruit was heard, did not produce this effect. The temperature of the limb was nearly natural, 98½° between the toes, 98° about the calf.

A few minutes after 10 P. M. bleeding was observed from the wound. When seen about half past ten, it had ceased. The cicatrix was entire, except the small opening from which the ligature depended. The quantity lost was estimated at about ℥viij, and was quite florid. The pulsation at the tumour was evidently less than in the morning. There was some puffiness around the cicatrix, and about an inch and a half to the outer side, a distinct pulsation. It was determined not to interfere farther than to make pressure at the part, with a pad of lint and strips of adhesive plaster, and to apply cold.

31st. At five o'clock this morning there was a slight escape of blood, not more than an ounce. About twelve at noon the hemorrhage returned with such violence that an arterial jet was forced out between the dressings to some distance. It was decided that the femoral artery should be tied again immediately below Poupart's ligament, which was accordingly done by Mr. Hewson.

The ligature was firmly tied, and the beating previously observable at the seat of the former ligature, and in the surrounding tumefaction of effused blood immediately ceased. It was also thought the aneu-

rismal sac and calf were less distended; the pulsation in the former, and the bruit along the course of the femoral artery, were stopped.

In the evening it was found that there had been a slight oozing of blood from the situation of the first ligature, and in the surrounding tumefaction, which was reduced in size, a decided pulsation could be felt, and, with the stethoscope, a faint bruit. The calf being measured at the same place as before, shewed a diminution in circumference of half an inch since the previous morning. The tumour was decidedly softer, and no impulse could be perceived with or without the stethoscope. The surface of the limb was more of the natural colour, and the veins, though swollen, were not observable unless special attention was directed to them. Temperature between the toes 90°, gradually rising as the instrument advanced up the leg, and at the calf the mercury stood at 102°.

August 1st. The temperature between the toes was 86°, at the ankle 95°, at the calf 100°. The tumour and the skin of the leg were more relaxed; pulsation diminished; bruit no longer perceptible with the stethoscope.

2d. Up to eight o'clock this evening he had been remarkably comfortable, the leg quite easy, and his spirits improved. At this period the bleeding suddenly recurred from the wound in the thigh where the first ligature had been applied. Pressure immediately above the wound controlled it, but, as soon as it was removed, the blood, in a stream as large as a

quill, was projected upwards a foot and a half. The cicatrix was laid open, and an ineffectual attempt having been made to find the mouth of the bleeding vessel, amputation of the limb was immediately performed. The upper part of the artery was found to be quite separated from the lower, upon which the ligature still remained, and to present an open mouth.

The operation was followed by great collapse, faintness, but not to syncope, and vomiting. He was covered with blankets, warm water was applied to the foot, and brandy, ammonia, and opium having been administered, the patient slowly revived. The temperature between the toes while the hemorrhage was going on was 90°, having increased 4° since the morning.

3d. The countenance was more composed and animated but pallid; there was a slight return of rosiness in the previously livid lips; pulse 125, very much improved in volume and strength.

6th. Pulse 84. The dressings were partly renewed at the stump, and some offensive matter removed. The wound in the groin had a healthy appearance.

21st. Up to this period his progress had been most satisfactory; he had very much improved in health and appearance, and his pulse for some days previously had been only 70. He had been allowed half a pint of porter and two glasses of wine daily, a few days before. At four o'clock in the morning the wound at the groin was observed to bleed; the

blood was florid and arterial, and did not come away in a full stream, but gently oozed up, and apparently did not amount to more than five or six ounces. A compress of lint and adhesive plaster was applied. Digitalis was given, and his generous diet gave way to one of milk.

At 11 A. M., there was a return of hemorrhage to a greater extent. The pulse was full and bounding. It was proposed to tie the external iliac artery, and secure the epigastric and circumflexa ilii; but the patient would not consent. He was therefore bled in the arm till the pulse became smaller and weaker, and a bladder containing salt and ice, pounded together, was applied over the groin.

About six o'clock in the evening a slight discharge of blood took place, and later at night the pulse rose in volume and strength. The blood removed in the morning presented a thin buffy coat.

22d. A very large and alarming bleeding suddenly burst forth at six o'clock P. M., which produced a frightful effect, and placed the poor fellow in greater jeopardy than he had ever apparently been before. At his request, the operation was therefore instantly performed; brandy having been first given in small but frequently repeated doses.

The mode adopted by Sir A. Cooper was followed. When the peritoneum was arrived at, the epigastric artery was nearly exposed at the lower part of the wound, and by a little careful dissection, was cleared and tied, the subjacent membrane having sustained no injury. The peritoneum was then drawn to the inner side of the wound along with the cord, and the

external iliac having been brought plainly into view, an armed needle was passed beneath it, and the ligature securely tied. The pulsation at the groin ceased. He vomited several times during the operation, although brandy and ammonia were frequently given, and the state of collapse, and diminished vitality, more than once gave rise to fears that the point, so warmly contested, would be lost ere this important measure could be accomplished. He rallied, however, and at ten o'clock was comfortable, the stomach having retained some tea. Countenance more cheerful. Pulse sharp and small, 130; surface warm. All stimuli were now interdicted.

23d. More cheerful and composed; passed a good night with several hours' sleep. The proper colour of the lips returning. Respiration regular and steady. Pulse 120, soft and compressible. The abdominal parietes, the previous night so sunk that the ilia stood up as in cases of death after protracted sickness and excessive emaciation, had recovered their tone and natural rotundity. There had been some pain at the wound, but it had ceased. In the evening of this day the pulse had decreased to 112, was soft and equable. He had nothing to complain of, and appeared remarkably improved.

24th. He was perfectly comfortable. Pulse 100; no tenderness of abdomen. The wound was dressed, and found adherent throughout. The ligature at the groin was loose in the wound.

28th. The case went on with perfect satisfaction till this day, when, at noon, hemorrhage again appeared at the wound in the groin, and it is thought

many ounces of blood were lost. It flowed at first gently from the part, afterwards in a larger stream, but not in a jet. Pressure with the hand restrained it. Graduated compresses of lint were carefully applied, and a truss so adjusted as to bring the pad to make firm pressure directly upon them. The truss, from the tightness with which it was applied, produced pain, which, however, an anodyne relieved.

29th. He was quite comfortable, excepting some uneasiness caused by the truss and one of the pieces of tape connected with it.

30th. The truss was removed, and the wound had a very healthy appearance, devoid of slough, and granulating favourably; the matter was small in quantity, and of a good character. The truss was reapplied in the same manner as before. Pulsation of the internal pudic artery was now observed. Pulse 100.

From this time the case went on quite favourably, and on the 4th of September the stump was nearly healed. The wound was perfectly healthy, and considerably contracted—the discharge was moderate in quantity, and quite healthy. The ligature applied to the epigastric was found loose in the wound.

On the 29th day after its application the ligature came away from the external iliac. The convalescence of the patient was steady and permanent. The wound rapidly and securely cicatrised, and on the 25th of October, the 101st day after the superficial femoral was tied, I saw him sitting in an apartment below stairs, very much improved in health

and appearance, and recovering his flesh and strength fast.

OBSERVATIONS.

When we consider the anatomical peculiarities of the femoral artery in the upper part of its course, viz. the uncertainty of the origin of the profunda femoris, the epigastric, and circumflexa ilii, as well as the probability of the internal circumflex artery arising from this vessel instead of the profunda, we might, without a fear of contradiction, and without reference to the result of experience, declare the common femoral artery singularly ineligible for an operation of this description.

We are acquainted with six recorded instances in which the common femoral artery has been selected for the application of a ligature, and two not hitherto given to the public. The dangerous hemorrhage which led the talented Abernethy to the performance of an operation never before attempted, was produced by a ligature placed upon this vessel. Sir A. Cooper has twice tied this artery; in one instance with success, in the other, hemorrhage arose on the fourteenth day, and death was the consequence. Sir B. Brodie has also tied this artery, and the result was hemorrhage and death. Dr. Murray applied a ligature to it, and owing to a violent bleeding which placed his patient, when the ligature was about to separate, in the utmost danger, he very properly tied the external iliac *. Mr. Ivory tied this vessel, and

* See Guthrie on the Arteries, p. 100.

in consequence of subsequent bleeding was under the necessity of taking up the external iliac. These are the six cases already recorded. In five of them violent bleedings followed, and in two of them death was the consequence, and would, in all probability, have occurred in the remainder had not the external iliac been tied. The two other instances alluded to occurred to Mr. Hewson. One was attended with a favourable result, the other with such bleeding that nothing, probably, but the operation to which it led, could have prevented a fatal termination. So that of eight cases in which a ligature was applied to this artery, six were attended with consecutive hemorrhage, two with death, and two with a favourable separation of the ligature; giving to this operation a highly dangerous character.

Contrast with this the result of tying the external iliac. Mr. Hodgson, when he published his work on the arteries, knew of twenty-two cases where the iliac was tied, and not in one of these was there any secondary hemorrhage. Since that period the operation has been performed a great number of times, and, as far as I can ascertain, with the same exemption from this alarming occurrence. I cannot, indeed, find a single case recorded of bleeding attending the separation of a ligature placed upon this artery; so that it may be said, not merely, as Mr. Hodgson observes, that the external iliac may be tied with as much safety as any artery to which a ligature has been applied, but that, of all the large vessels of the human body, it is the one that may be tied with the

greatest security, as far as the effects of the operation are concerned, and with the best effects upon diseases to which it is applicable.

There is no case, except that of wound of the artery at the groin, in which tying the common femoral possesses any advantage over the ligature of the iliac; I am therefore justified in concluding that the common femoral artery ought never to be selected, in any case of disease, for the application of the ligature, and that the operation should be exploded. It must, however, be added, that no preference is here claimed for the external iliac over the superficial femoral artery for the operation, in cases of popliteal aneurism, as some surgeons have suggested *, for we are decidedly of opinion that the operation of the illustrious Hunter, with Scarpa's modification, is in the first instance to be preferred. The volume of blood that must re-enter the main trunk by regurgitation through the profunda, if the ligature were placed in the first instance any where above its origin, will ever form, in my opinion, an insuperable objection, in the minds of all judicious surgeons, to the adoption of this method.

* See Harrison, Vol. II. p. 126.

CASE

OF

HYDATID OF THE LIVER,

SUCCESSFULLY TAPPED.

By WILLIAM TRAVERS COX, M.D.,

OF YARMOUTH.

READ MARCH 13TH, 1838.

George Goose, aged 32, a muscular man, of sallow complexion, employed as a coal-heaver, complained in January, 1832, of pain and tenderness in the epigastrium, with occasional sickness, and was relieved by counter-irritants, demulcents, and aperients. Two or three months afterwards, he was a patient in the Norfolk Hospital, where ascites supervened upon an aggravation of his former symptoms. Sent out of the hospital, he was put under a course of mercury by a physician, and, while salivated, he said the abdomen decreased in size, but increased again. He consulted me. He was jaundiced; his pulse [illegible] strength; bowels irregular; tongue [illegible] pain except tenderness in the umbilical region upon deep pressure, in the loins. [illegible] emetic ointment, and va-

rious diuretics were tried without effect; the belly became distended to an enormous size, and the patient consented to be tapped. On October 26th, this operation was performed by Mr. Taylor, sen., and twenty-one pints of fluid were drawn off, appearing of the colour and consistence of ordinary bile. One ounce of this, evaporated, left half an ounce of coagulated fibrine and colouring matter, which latter was, for the most part, soluble in rectified spirit. On examining after the operation, which was borne well, the liver was found considerably enlarged. I now resolved upon the use of iodine internally, and externally by friction on the region of the liver. The patient took iodine with nitrate of potass and a diuretic drink; at the same time, he took occasionally small doses of elaterium, and had the strength supported by a moderately nutritious but unstimulating diet. Under this treatment, there was an increase in the quantity of urine, which, from being high-coloured and depositing a copious sediment, became pale, clear, and not turbid, as formerly, on the application of heat. From the time when the operation was performed, there was no fresh accumulation of fluid in the abdomen; the liver at the end of some weeks was very sensibly decreased in size, the stools were tinged with bile, the kidneys acted regularly, there was no pain or tenderness, and the man's health, strength, and appetite becoming nearly as good as formerly, he returned to his employment as a coal-heaver.

In April, 1836, this man came under my care

again, as a dispensary patient, when I saw him along with Mr. Alared, the surgeon. He had been well, and almost constantly at work, for the last three years, until two months ago, when he had severe pain of the right side, with cough, dark expectoration, and fever. The cough and severe pain had continued, and when he presented himself at the dispensary, he was expectorating large dark coagula, occasionally offensive puriform matter, and large quantities of dark fluid blood. His pulse was soft, full, and rather more frequent than natural; his tongue red and moist; his face slightly jaundiced; he had irregular perspirations and rigors, and had lost appetite and flesh. The sound, on percussion over the upper parts of each lung, was sufficiently clear; on the lower lobe of the right lung dull. Respiratory murmur over the right lung loud, almost puerile; on the right mixed with a mucous and sibilous râle superiorly; inferiorly and posteriorly, over a circumscribed space, was a loud loose râle or "garguillement", which could be traced up to the root of the lung. In the same situation, could occasionally be heard a loud circumscribed bronchial or cavernous resonance of the breathing and voice. It may not be necessary, and therefore it would be tedious, to enter into particular detail of this part of the case. It will be sufficient to say, that having formed a diagnosis, namely, that there was broken up structure towards the posterior part of the base of the right lung, the result of inflammation, which was probably in connection with the dis-

ease on the upper surface of the liver, and continued into a large bronchial tube, I treated the man with dilute sulph. acid and mild tonics; tart. emetic ointment, and sometimes pills of oxide of zinc, digitalis, and extract of taraxacum with a little pil. hydrarg. occasionally. The hemoptysis and other expectoration was arrested, and the man's general health improved; and thus he continued for two or three months, when the hemoptysis again returned, was again checked, but, returning once more, the patient brought up two hand-basons full of blood, and sank on Saturday, the 4th of this month of November, 1837.

I need not dwell upon some obviously interesting features in this case, as the character of the fluid removed from the abdomen, the circumstance of recovery after the one operation of paracentesis, and the cure by the direct influence, as it seemed, of iodine upon the liver. I will rather pass to that part of the post mortem examination which gave the motive for publishing this paper. But first, upon opening the chest, the lungs were found to collapse but little, and upon cutting into them, they were loaded with frothy sanguinolent fluid throughout, except toward the base of the right lung, which was firm and uncrepitating. The upper lobes of both lungs, but especially the left, contained tubercles in different degrees of maturity, but none larger than a pea. Upon trying to remove the right lung, all its base was found adherent to the diaphragm. This was partly separated by dissection, but towards the

posterior edge the adhesion was found to be quite ligamentous. On dividing this part of the lung, a small cavity was seen lined with firm, almost cartilaginous membrane, and containing clots of dark grumous blood, puriform matter, and pieces of coagulated fibrine. This cavity, of almost the diameter of two fingers, was continuous with a dilated bronchial tube, whose lining membrane was thickened, and here and there ulcerated. One or two vessels opened into the cavity. The surrounding lung was condensed, and of a greyish yellow colour, but not presenting tubercles, or any other loss of substance than this described. The first object seen or regarded upon opening the abdomen was a large distended cyst with a smooth surface, occupying, as at first appeared, the position of the gall-bladder, and supposed to be that viscus distended considerably. But when the liver was completely exposed, and the cyst brought well into view, it was found attached by a small portion of its surface to the right of the gall-bladder, and in the front of the transverse fissure. The gall-bladder itself presented nothing unnatural in appearance; the liver was somewhat enlarged, and throughout in a state of uniform venous congestion. Circumstances prevented any further examination of the body. The cyst, however, we got leave to remove. It was attached by almost a fifth part of its surface to the substance of the liver. It had no other connection than through these filiform products of the fibrous coat of the liver. This spread out into a fibrous investment, which covered the whole surface

of the cyst, and which is partly dissected off. When removed, it was of an oval shape, about four times the size of the gall-bladder, contracted in its centre, where was a small piece of cartilaginous structure. It was fully distended, elastic, and semitransparent towards its surface, upon being held before the light. It was necessary to make a large opening before the contents of the cyst could be removed. Upon doing this, a firm transparent yellow gelatinous mass was squeezed out, which presented exactly the shape and smooth surface of the cyst. On examining this, it was found to consist of concentric layers, which could easily be unrolled one from the other. They were about two lines in thickness; the outermost, those nearest the cyst, were most transparent and had least colour. Toward the centre they became more opaque, yellow, less firm, and distinguishable; and within all was a quantity of concrete bile. The outer layers were so firm, that they could not easily be torn. They were rendered more firm and opaque by the application of heat, became softer and more transparent in sulphuric and nitric acids, and again firm and opaque upon the addition of water. Between these fibrous layers, lay here and there small pieces of a substance resembling that which is used in the dissecting room for injecting the arteries, of a waxy feel and consistence, and of a bright vermilion colour*.

* A preparation was afterwards exhibited to the Society by Mr. Thurnam, of a supposed acephalo-cyst from the liver of a patient who died in the Westminster Hospital, which contained a substance very closely resembling that here described, in co-

The inner surface of the cyst is smooth and serous, but abraded in places by the deposit of a concrete bilious matter, which has not been removed by maceration in water and spirits.

As I have avoided, in drawing up this case, unnecessary details, I shall, for the same reason, abstain from conjectures and comments upon the circumstances, whose interest is, I hope, sufficient to excite the attention of those whose pathological investigations have been more extensive than my own.

NOTE, by Dr. Bostock, F.R.S., &c.

I RECEIVED from Mr. Perry a small quantity of the red substance mentioned above, with a request that I would examine its properties. It was of a very bright red colour, and, on the first view, much resembled the injection which is used by anatomists; but, on a closer inspection, it presented somewhat of a granular or fibrous texture, and seemed to consist of two substances, very minute red particles, imbedded in a mass of a different kind of matter. It was not fusible, and, when heated on bibulous paper, did not produce a greasy stain. A small portion of it, being exposed to a low red heat, swelled out very considerably, and at length burst into a bright flame, leaving a bulky carbonaceous residuum. Supposing that it

lour and consistence. Of this substance no chemical examination had been made.—EDITOR.

might be some modification of the hepatic secretions, I subjected small portions of it to the various re-agents which produce the most marked effect on the resin of the bile, or the specific matter of biliary calculi, but without any very satisfactory or decisive results. It was scarcely affected by boiling water, alcohol, sulphuric ether, or the essential oil of turpentine, and it was but little acted on by liquid chlorine and by muriatic acid. By being digested in boiling water its texture was destroyed, and the water was tinged of a brown colour, but no further effect was produced. No effect was produced by digesting the substance for twenty-four hours in alcohol, except that it was rendered somewhat firmer in its consistence. No effect was produced on the substance in question by sulphuric ether, the essential oil of turpentine, or liquid chlorine. Diluted muriatic acid, after being digested on the substance, acquired a yellow tinge, while the red colour of the substance was rendered somewhat less bright, but no further effect seemed to be produced. The action of nitric acid was more powerful, the acid acquired a blood-red colour, while the substance was broken down and converted into a soft, whitish, saponaceous mass. The addition of potash threw down a small quantity of a white flocculent precipitate, showing that a slight degree of solution had taken place. The re-agent which produced the most powerful effect was potash. A large proportion of the substance was apparently dissolved, but the red colouring matter subsided in the form of very minute particles; the fluid was rendered opake

and brown. Being passed through a filter it became clear, and gradually assumed a dingy green colour, while a thin film of yellow matter, which resembled dried bile, was left on the paper.

I regret that I am able to offer so little that is satisfactory respecting the nature of this red substance, but it may afford at least some apology for my want of success, when I state, that the whole amount of the substance on which I had to operate, was not more than between five and six grains.

Upper Bedford Place,
May 26, 1838.

ON

BLACK EXPECTORATION,

AND THE

DEPOSITION OF BLACK MATTER

IN THE

LUNGS,

PARTICULARLY AS OCCURRING IN COAL MINERS AND MOULDERS IN IRON WORKS.

By WILLIAM THOMSON, M.D.,

FELLOW OF THE ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH.

PART II.

Communicated by Sir JAMES CLARK, Bart., M.D.

READ APRIL 24TH, 1838.

In a former communication, I had the honour to bring under the notice of the Society a number of instances of black discolouration of the sputa, observed during life, and of black infiltration of the lungs and bronchial glands, ascertained after death, in persons who, from their occupations, were particularly exposed to the inhalation of carbonaceous powders or gases, such as coal-miners and moulders in iron-works. Before proceeding, as it is my intention to do in a subsequent communication, to state the general conclusions, relative to the occurrence of these morbid

appearances in this particular class of persons, which seem deducible from the information that has hitherto been obtained, and to point out those circumstances which still require further elucidation, there are several collateral topics, to which I am desirous to call the attention of the Society.

In the following communication, therefore, I shall, in the first place, briefly recapitulate the observations and opinions respecting black sputa and black deposition in the pulmonary organs, to be found in the writings of authors, previously to the time when the class of cases, to which I have alluded, began to attract attention. This will afford an opportunity of showing that black deposition may occur in the pulmonary organs, independently of the habitual inspiration of an atmosphere, which can be supposed to be peculiarly loaded with carbonaceous matters. The cases of this kind that have been recorded may be arranged under two heads; first, those in which the respiratory have been the only organs affected; and secondly, those in which the black deposition has been met with in a number of different textures and organs of the body besides the lungs. We shall find that much difference of opinion has existed among authors, as to whether the black matter in these two sets of cases is identical or different in its nature; whether, in short, they are all to be regarded as examples of that form of morbid animal production which is denominated melanosis; or whether, whilst the second set fall under that denomination, the first are to be regarded as of a different character. We

shall find also that the opinions of pathologists have widely differed as to whether the black matter, when occurring exclusively in the lungs, should be considered as of extraneous origin, or as generated within the body.

In conclusion, I shall lay before the Society, extracts of communications from gentlemen in different parts of the country, which seem to shew that the phenomena in question are not met with among the workmen in all coal-districts, or even in all the coal-mines of a district some of the mines in which are known to furnish examples of them.

Observations and Opinions of Authors.

The recorded observations and opinions of authors respecting black expectoration and black deposition in the pulmonary organs, I propose to notice in the following order: first, as they relate to the presence of black matter in the expectoration; secondly, as they relate to its presence in the bronchial glands; and thirdly, to its presence in the lungs.

I. THE PRESENCE OF BLACK MATTER IN THE EXPECTORATION.

1. *Notices by authors of this occurrence.*—The expectoration of black sputa, or of sputa containing black specks or striæ, has long been noticed by different medical observers, as occurring in various pulmonary affections, phthisical and asthmatical, as well as in persons apparently enjoying good health. From their descriptions, however, it would appear that the

quantity of black matters which they had seen expectorated was very trifling in comparison with that which occurred in the cases that have been related in my former communication.

Hippocrates [1],* in mentioning the different prognoses to be derived from the appearance of the expectoration, speaks of black sputa as a symptom of danger†. "Perniciem etiam denunciant sputa nigra, fuliginosa, aut quibus qualia ex vino nigro fiunt."

From an incidental notice by Morgagni [2], it would appear, that Salius Diversus, in his Commentaries on Hippocrates, alludes to some cases of persons affected with black spittle, who had fallen under his own observation; but I have not had an opportunity of consulting the work referred to.

Willis [3] makes several allusions to persons voiding, with a slight cough, sputa like black ink, often in a day, and especially every morning, for many months; and states that in some this symptom disappeared on the supervention of a severer cough, attended with a copious expectoration of yellow spittle.

The continued expectoration of black and viscid phlegm in a morning, is mentioned by Morton [4] amongst the signs affording a prognostic of consumption.

Haller [5] observes, that black striæ very frequently

* The numerical references are to the bibliographical appendix at the end of the paper.

† Ὀλέθριοι δὲ καὶ οἱ τὰ μέλανα λιγνυώδεα πτύοντες, ἢ οἷσιν ἀπὸ οἴνου μέλανος γίνεται πτύσματα.

mix themselves with the pulmonary mucus of adults, and that he had noticed a pigment of this kind in his own sputa from a very early age.

Withers [6], after quoting an observation of Floyers, that the spit of asthmatics is sometimes full of black streaks, adds, that he himself had seen this appearance in many cases of asthma.

It is stated by Portal [7] that there are many persons who, without experiencing any disease of the lungs, discharge by expectoration black matter resembling blood of a very dark colour. He had seen several persons who every morning had in their sputa bodies more or less solid, sometimes round and black, and frequently of a cobweb appearance. Many persons, he observes, have had an expectoration of this kind for a length of time, and even during the whole of their lives, without experiencing any inconvenience; but he had known others in whom it had occurred, who had at last died phthisical.

Dr. Bree [8] mentions that spitting of black mucus is a symptom that often occurs, though not invariably, in asthma as well as in the pituitous consumption; and that he had frequently observed an expectoration of black mucus in asthmatics, when there could be no suspicion of the rupture of any small vessels.

Dr. Pearson [9] remarks, that in a morning, healthy people, after the night's rest, very commonly hawk up mucous matter of a bluish colour with black

streaks; and that persons in a diseased state, especially by great exertions in coughing, frequently expectorate matter spotted and streaked with black particles.

Chomel [10] observes, that the sputa are frequently striped with black in healthy persons who have remained for a length of time in an atmosphere loaded with the vapours of oil or of tallow; but that this phenomenon, though sometimes occasioning alarm, is not indicative of any dangerous consequences.

The only other author whom I have to quote, in reference to this subject, is Laennec [11], who alludes to sputa of a grey colour which many individuals, otherwise healthy, spit up; and to small black points that sometimes present themselves in the transparent bronchial mucus *.

2. *Sources to which the black matter occasionally appearing in the expectoration has been referred.* —With respect to the source and nature of the matter by which black discolouration of the sputa is produced, various opinions have been entertained.

1st. By some it has been supposed to be a secretion from the bronchial glands. 2d. By others from the glands of the mucous membrane of the trachea.

* I find the following reference in Ploucquet's Literatura Medica, under the article *Sputa Nigra*, but I have not been able to lay my hands upon either of the works referred to. Rubini, in Giornale della Societa, &c., di Parma, Vol. I. No. 2. Vide Harles N. Journ. des Med. Chir. Literatur. B. X. St. II. p. 62.

3d. By others from the exhalents of the pulmonary air-cells; and 4th. By some it has been regarded as of extraneous origin.

1st. Of those who have regarded the bronchial glands as its source, some have believed that it is a natural secretion, and that it is conveyed from these bodies to the cavities of the air-passages, by natural communications; whilst others have looked upon it as a morbid production, and the channels by which it is conveyed, as consequences of disease.

Morton [4] is the first author, so far as I have been able to discover, who attributed its production to the bronchial glands. Senac [12], though he does not allude to black sputa, seems to have considered the secretion of a black fluid as being the proper function of those bronchial glands which are themselves of a black colour: at least during the fœtal state, to which period, indeed, he limited their use in the economy. He states that he had clearly seen the excretory canals by which they open into the trachea, and that when he pressed the glands, a black liquor exuded through these canals.

2nd. The accuracy of Senac's observations was called in question by Morgagni [2], who did not admit the existence of any ducts or channels leading from the bronchial glands to the cavity of the trachea. Morgagni conceived that as there are other glands which evidently discharge their secretion into the trachea and beginning of the bronchia—those, namely, which are situated in the substance of their mucous

membrane, these, and not the bronchial glands, must be the source of the black fluid sometimes met with in the expectoration, or in the cavities of the air-passages.

Haller[5] considered the bronchial glands as belonging to the lymphatic system, and as connected with lymphatic vessels which come from the surface of the lungs and pass through these glands on their way to the thoracic duct. He had not himself been able to discover, nor was he disposed to believe in the existence of any ducts by which they can discharge a fluid into the bronchia. The state of these glands in which they are turgid with a fluid of a deep blue colour, which communicates a dark and almost black stain, and nearly resembles the pigment covering the posterior surface of the iris, except in being of a deeper blue,—he regarded as a peculiar affection occurring in adults. At the same time he conceived that in the cases in which the sputa are striped with black, there must exist passages between the bronchial glands and the bronchi, by which the blue pigment is conveyed from the former to the latter. He mentions Carolus a Bergen, as corroborating Senac's statement of its being possible to press a black fluid out of these glands.

Withers[6] seems to have adopted Morgagni's suggestion that the bluish or grey-coloured phlegm comes from mucous glands in the bronchia, which, he says, are nearly of the same colour.

Portal[7] distinguishes three kinds of black matter as being occasionally contained in the expectoration,

one depending on the inhalation of carbonaceous matter; a second, on a fluid secreted by the bronchial glands; and a third, on blood extravasated into the air-passages. To the first of these, that which is expectorated by persons who have respired for a length of time black emanations, whether of charcoal or of soot, he alludes in only a cursory manner. The two other kinds of black expectoration he treats of in some detail. He gives positive testimony, from personal observation, to the passage of a black fluid from the bronchial glands into the bronchia and trachea, by several openings, when the glands are slightly compressed. The black spit arising from this cause is unattended with danger; and he conceived that it may be distinguished from the third form of black expectoration, which depends on hæmorrhage, and which is almost always attended by fatal consequences, by the circumstance, that when black matters, furnished by the bronchial glands, are thrown into hot water, they are instantaneously dissolved; communicating more or less colour to the water as ink would have done; while the black matter arising from hæmorrhage is dissolved much less readily, is precipitated in the form of a black powder, never very globular, almost always of a cobweb appearance, and scarcely, if at all, colouring the water.

3d. The opinion that the black matter occurring in the sputa, comes from the pulmonary air-cells, originated, so far as I have been able to discover, with Dr. Bree[8]. "I believe the material which

colours the mucus," says he, "to be the carbon of the blood, which in the healthy state of the system, was exhaled in carbonic acid, the atmospheric air having been then properly decomposed. In asthma the system is not sufficiently invigorated with oxygen, and hydrogen holding carbon in solution predominates in the system, and gives to the arterial, too much of the colour and quality of venous blood. An expectoration of this kind may, therefore, be expected, when a very considerable extent of the vesicular surfaces is covered from the contact of air by a coat of serum; but that predisposition of the blood, which leads to the pituitous consumption, as well as to asthma, may at all times favour the appearance." Dr. Bree did not admit that the black colouring matter could in any case come from the bronchial glands, though he seems to think it possible that it may, in some instances, proceed from the glandules which open into the trachea or bronchia.

4th. Dr. Pearson [9] conceived that the black matters observed in the sputa are not of internal but of external origin; that they are in fact the larger particles of carbonaceous vapours with which the air is impregnated, which being inhaled into the lungs, become entangled in the mucus lining the air-vessels, and are rejected from time to time by expectoration. The opinions of this author, it will be necessary to consider more at length in treating of the deposition of black matter in the lungs.

We have seen that Chomel [10] attributed the

appearance in question to the respiration of an atmosphere loaded with carbonaceous vapours.

II. PRESENCE OF BLACK MATTER IN THE BRONCHIAL GLANDS.

From the view that has just been taken of the different opinions entertained by authors respecting the source of the black matters occasionally met with in the sputa, it is obvious how much the explanations that have been given of this phenomenon, have turned on the views entertained respecting the structure and functions of the bronchial glands. We have seen that some authors have supposed that the black matter which is found in the bronchial glands is formed in these bodies and conveyed from them to the air-passages, by natural or morbid communications; but others assign to that matter a course directly the reverse, alleging that it is conveyed from the lungs to the bronchial glands by lymphatic absorbent vessels.

Of those who have entertained the latter of these opinions, some have conceived that the carbonaceous matter with which the bronchial glands are discoloured, originates within the lungs; and others, that it is introduced into these organs from without, suspended in the atmospheric air which is breathed. The grounds for these two particular explanations will be considered afterwards. At present I have only to advert to the evidence in support of the more general supposition, that the bronchial glands do not

produce the black matter with which they are tinged, but derive it from the lungs through the lymphatic absorbents.

Reisseissen [13] is the first author by whom I find this opinion to have been expressed. He conceives that in the progress of life, the lymphatic vessels of the lungs diminish very much in width, and in the freedom of their communication with the bronchial tubes; and that though they still continue to exercise, in some degree, their proper function of absorbing the carbonaceous matter which is exhaled from the blood into the air-cells, they are unable to convey the matter which they take up, into the general absorbent trunks. Part of it, consequently, he conceived, accumulates in their primary branches and obstructs them; and the portion which is conveyed to the bronchial glands is not taken up by their *vasa efferentia*, as was the case at an earlier period of life, but accumulates in the glands, so as sometimes to occasion their disorganization.

Soemmerring [14] entertained the same view with Reisseissen as to the black matter contained in the bronchial glands being conveyed to them from the lungs by the lymphatic vessels; though differing in the opinion he held respecting its mode of formation. In mentioning the proofs of the action of absorbent vessels in the lungs, he remarks that all anatomists are sufficiently aware that the bronchial glands are filled by a black matter, true pine-soot, particularly among the common people who burn bad tallow

or coarse oil, which matter can find its way into the bronchial glands only through the air passages.

Dr. Pearson [9] held that the opinion of the black or dark blue colour generally exhibited by the bronchial glands in adult man, being occasioned by a peculiar secretion in these glands, is palpably erroneous; inasmuch as they are not organs of secretion, but of conveyance of lymph.

He explained the production of these colours by supposing that the lymphatic vessels which arise in the bronchial tubes absorb the coaly matter that is contained in these tubes, and convey it to the bronchial glands.

III. PRESENCE OF BLACK MATTER IN THE LUNGS.

Diemerbroeck [15] seems to have been the first author who made special mention of black discolouration of the lungs. He states that he had found them of this colour in diseased bodies, and particularly in those of persons, who during life, had been much given to the smoking of tobacco.

Haller [16] mentions the case of a man, one of whose lungs "was not indeed purulent, but overflowed with a matter like ink." In another case he had found a similiar black matter in the cavity of the chest.

Morgagni [17] mentions a case in which the lungs seemed as if they had been dyed with ink.

Reisseissen [13] gives the first description I have met with of that form of black deposition in the lungs

which is now well known to occur very generally in persons advanced in years, and in which the deposition assumes the form of striæ or patches. He attributes it to that obstruction of the lymphatic vessels communicating with the air-cells, which, as we have already seen, he conceives to occur in the progress of life, so that in very old people, a large portion of these vessels appears to be inoperative. Accordingly, the black striæ alluded to, are always found on the surface, and in the substance of the lungs of adults, and in greater abundance proportionally with their age; whilst they are not to be met with in the fœtus or very young child. Reisseissen states, that on accurate examination, it is found that this black matter surrounds the small pulmonary lobules, is deposited between the air-cells, and particularly in the spaces in which the lymphatic vessels collect. Hence it is, that they describe mesh-formed striæ around the lobules. He was satisfied, that in these instances, the black matter is contained in the lymphatic vessels; and he looked upon it as established by the analyses of chemists that it is really carbon.

A still more elaborate account of the striated or spotted form of black deposition in the lungs, was given by Dr. Pearson[9]. He states, that at the age of about 20 years, the lungs have a mottled or marbled appearance, from black and dark blue spots, lines, and points disseminated immediately under the transparent pulmonary pleura. "As hath been repeatedly observed," he continues, "the lungs generally become more dark coloured proportionally to their age. Ac-

cordingly, at upwards of 65 or 70 years of age, they often appear almost uniformly black, from the number and congeries, or coalescence of the maculæ, points, and lines just mentioned. Throughout the whole interior substance of the lungs, the black spots are seen, in a great measure corresponding to the external appearance." Dr. Pearson was aware, however, that the quantity of black matter in the pulmonary organs is not entirely according to the age, for in a woman of 75 years of age, residing in London, he found the lungs and bronchial glands not more deeply coloured than is usual at the age of 50.

Reisseissen, as we have already seen, referred to the analyses of chemists as establishing the carbonaceous nature of this black deposition. Dr. Pearson, who was not aware of any observations or experiments having been made to determine its nature or cause, instituted a series of experiments on the black matter obtained from the bronchial glands and lungs respectively, by which he satisfied himself that it consists of animal charcoal in the uncombined state, i. e. not existing as a constituent ingredient of organized animal solids or fluids. "I mean by the term animal charcoal," he observes, "what is popularly understood. Of course I do not mean pure charcoal. Such a state of this substance cannot here be reasonably expected, either from a consideration of the state of it as inspired from the atmosphere, or from its necessary impregnation with animal matter during its long residence in the lungs. I imagine, no person would hesitate to consider such a coaly substance as the

present to be charcoal, if derived from other sources besides the animal economy; it being, as shewn by the experiments related, a black, tasteless, infusible powder, indissoluble in muriatic acid, nitric acid, and perhaps all common acids except the sulphuric; affording as large a proportion of charcoal acid as animal and vegetable charcoal, which has been exsiccated at the same temperature, and equally resisting fire in close vessels."

There is no part of Dr. Pearson's memoir on this subject more creditable to his sagacity, than that in which he has pointed out the grounds of distinction between the black matter found in the lungs, and those other black matters that are found in other parts of animal bodies; and has applied these distinctions to the proof of the black pulmonary matter being of extraneous origin. "The blackness of the lungs from charcoal," he remarks, "remains although hæmorrhage to occasion death has occurred. It is not removable by ablution, or maceration in water, nor by acids, nor alkalies, nor by the early stages of putrefaction. I have not met with a similar coaly substance in any parts of the animal economy except the lungs. The glands of the meso-colon are sometimes black, similar to the bronchial; but the colour soon disappears on immersion in nitric or muriatic acids, no charcoal being separable. The black or more truly the dark-brown tingeing liquid of the sepia, I have ascertained by experiments, does not contain uncombined charcoal: this matter existing

there only as a constituent ingredient of animal matter."

This observation of Dr. Pearson's seems calculated to overturn an argument adduced by Bichat [18] against the supposition of the black colour of the bronchial glands being attributable to their connexion with the lungs. In speaking of the organization of the lymphatic glands generally, and the varieties in their colour, Bichat remarks that the colour is different in different regions of the body. Thus, says he, the bronchial glands have a blackish tinge, partly inherent in their structure, but also owing, probably, to the fluid which they contain, as is proved by the appearance of that fluid when expressed from the divided gland. That this colour does not depend on the vicinity of the lung and the colour of that organ, which is also, as is well known, sprinkled with black spots, he conceives to be sufficiently established by the fact that he had very often found the lumbar, mesenteric, and other lymphatic glands also black. But there is no part, he adds, where this colour is more common than about the lungs. This argument, obviously falls to the ground if Dr. Pearson's statement be correct, that the blackness of the bronchial and that of the other lymphatic glands alluded to by Bichat, depend upon different chemical agents.

As to the source of the carbonaceous matter met with in the lungs, Dr. Pearson alludes to a conjecture as having been proposed, that sooty matter taken in with the air, may be the occasion of the black co-

lour of the lungs; and to the supposed refutation of this explanation, founded on the absence of black discolouration in the lungs of brute animals, and on its presence in persons who breathe the air of the provinces at a great distance from towns, or from places where much coal is consumed. Notwithstanding these objections, he was himself satisfied that the charcoal which is found in the pulmonary organs, is introduced in breathing, with the air, in which it is suspended in invisibly small particles, derived from the burning of coal, wood, and other inflammable materials in common life. The particles of charcoal he conceived to be retained in the minutest ramifications of the air-tubes, or even in the air-vesicles, so as to produce the coloured appearances on the surface and in the substance of the lungs. "Future observations," Dr. Pearson adds, "must determine more satisfactorily the state of the pulmonary organs, according to the impregnation of the air with sooty vapours. If, hereafter, it be shewn that the lungs of persons living remote from sources of such vapours, are still greatly impregnated with coaly matter, the just conclusion can only be that such matter is more extensively diffused through the atmosphere than is apprehended. This being the fact, it would also afford a proof that it is only the invisibly small particles which are absorbed."

Dr. Pearson mentions that in no instance had he observed the lungs and bronchial glands so black, or been able to separate from them so much charcoal, as in those of a person forty-two years old, whose

death was occasioned by most extensively diffused tubercles, many vomicæ, and a considerable condensation of the pulmonary organs. "This subject had been," observes Dr. P., "a smoker of tobacco, generally several times, but always once a day, for perhaps more than twenty years." This observation is interesting in two respects; first, from the confirmation it seems to give to Diemerbroek's statement respecting the lungs of tobacco-smokers; and second, from its being an example of a form of black deposition in the lungs, to which I shall afterwards more particularly allude, in which it occurs in combination with other morbid alterations of these organs.

The coaly matter after being deposited in the lungs, is, Dr. Pearson conceived, very slowly absorbed by the mouths of the lymphatic vessels in the innumerable air-tubes and cells;—an opinion in which, as has been seen, he had the concurrence of Reisseissen and Sömmerring. "When I compared," says he, "the black lines and black net-like figures, many of them pentagonal, on the surface of the lungs, with the plates of the lymphatic vessels by Cruikshank, Mascagni, and Fyfe, I found an exact resemblance." "To determine whether or not this matter exists in the lymphatic vessels, and is the occasion of the black maculæ, streaks, and areolæ, or marbled appearance of the surface of the lungs, these vessels were injected with quicksilver. In some trials, the injection passed, without interruption, in the usual manner; but in others it was apparently obstructed, by meeting with the black lines on the surface. About an inch in

length of one of these black lines, supposed to be a lymphatic vessel, was cut out, and put into a glass capsule full of nitric acid, upon which the black line was immediately contracted in all dimensions; but it retained its form after digestion for several days, at a high temperature: afterwards, on gently shaking the capsule, the black line was broken into a number of indissoluble particles." "Hereafter," Dr. Pearson suggests, "among other inquiries, the colour of the large trunks of the lymphatic vessels, just before they enter the bronchial glands, and just as they pass out to them, ought to be observed."

The authors to whose opinions relative to the presence of black matter in the lungs I have next to call attention, are the three distinguished French pathologists, MM. Bayle, Laennec, and Andral, whose labours have contributed so materially to the advancement of medical science. The writings in which they are recorded were, it must be remembered, published subsequently to the recognition of melanosis as a distinct morbid product; and accordingly the object which they have had principally in view has been to determine the relations of black discolouration of the lungs to melanosis.

In 1810, M. Bayle published at Paris his work entitled "Recherches sur la Phthisie pulmonaire." Among the six species of this disease which he endeavoured to establish, M. Bayle included that of "phthisis with melanosis." In the account which he gives of this species, he mentions that it is not very rare in its occurrence, and that prior to his

own time it had frequently been seen by authors, without their having given a distinct account of it. He has not, however, given any references in support of this remark or statement.

Without at present entering on the question whether the cases to which Bayle refers were really of the nature of melanosis, I shall endeavour to give the general results of his observations respecting the particular form of pulmonary affection described by him under that name.

According to Bayle's observation, melanotic phthisis attacks only adults, and particularly those advanced in life, seldom occurring in persons under fifty years of age. In the lungs of those who die of this affection, M. Bayle had found ulcerations (cavities?) of greater or less extent, with parietes as black as charcoal. These parietes were very hard, sometimes a few lines and sometimes even a few inches in thickness. The parts at a distance from the ulceration he had observed to be usually very healthy: but if the disease affected a whole lung, it was hard, compact, and as black as ebony or charcoal, sometimes resembling half-burned leather.

Respecting the symptoms of this form of phthisis, M. Bayle remarks that it is frequently of long duration, and that it in general goes on for a great length of time, without producing any alarming symptom. The patients have a moderate cough accompanied with white or whitish sputa, which do not always appear to be of a very bad character. These sputa, M. Bayle farther describes as being generally round and

somewhat opaque, and as being almost always expectorated along with a pretty considerable quantity of thinnish phlegm: if the expectoration does not consist in part of a pituitous matter, the sputa alluded to are very consistent, but they swim in water in place of sinking to the bottom of the vessel. I quote at length these observations of M. Bayle, respecting the character of the sputa in melanotic phthisis, in order to shew that no allusion is made by him to the occurrence in this disease of any black discolouration in the expectoration.

When this form of phthisis is simple, that is to say, unaccompanied by any other morbid alteration in the structure of the lungs, the patients, according to M. Bayle's observation, experience scarcely any uneasiness in the chest, and merely complain that the cough prevents them from sleeping; they lose flesh slowly, and their pulse is in general a little more frequent than ordinary. Even in the latter periods of life, some patients affected with this disease, though in a state of extreme marasmus, and frequently expectorating copiously, seem to be scarcely indisposed; and in some the malady does not assume a serious aspect till within a few days of their death. During the latter months of their illness they usually become subject to œdema of the limbs, but this in general yields readily to proper treatment.

But melanotic phthisis, according to M. Bayle's observation, is more frequently complicated with tubercular phthisis than simple, the tubercles, however, being few in number. It is also, he observes,

sometimes combined with granular phthisis, as well as with some of the other species of phthisis which he has described. He remarks that in general when melanotic phthisis is complicated with another species, the complication accelerates the death of the patient, and the altered portions of the lung are less black and less hard than in cases of simple melanotic phthisis. But if it be with granular phthisis that it is complicated, the death of the patient is little accelerated by the complication, and the parts of the lungs affected with melanosis become very hard and very black.

For the illustration of this form of phthisis, M. Bayle relates seven cases. In two of these, that of a surgeon 52 years of age, and that of a hair-dresser of 69, the melanotic phthisis was simple. In three it was combined with tubercles. The subject of one of these cases was a hair-dresser of 62; that of a second, a dealer in tobacco, of the same age; and that of the third, an African negro, a house servant, only 25 years old. Lastly, in the other two cases, the melanotic affection was complicated with what M. Bayle called granular phthisis. The subject of one of them was a woman 72 years of age, and that of the other, a perfumer of 48.

In four of the cases related by Bayle, the two in which the melanotic phthisis was simple, one of those in which it was combined with tubercle, and one in which it was combined with granular phthisis, the deposition of black matter was very considerable, and the lung had acquired a very black colour. The

three other cases presented only the first shade of melanosis, the portions of lung that were altered being much less black than they would have been if the melanosis had reached its last degree.

From this review of M. Bayle's cases of phthisis with melanosis, it is of importance to be kept in view that in only one of these cases does there appear to have been any trace of black discolouration detected in any other part of the body besides the lungs; and in that case, in which there co-existed tuberculo-melanotic lung and scirrhous stomach, the black discolouration was confined to spots on different parts of the peritoneal coat of the intestines. Every anatomist knows, however, that this is a situation in which similar black spots are frequently met with, when there are no traces of melanosis in any other part of the body.

In comparing Dr. Pearson's description of the black discolouration of the lungs with M. Bayle's account of melanotic phthisis, it is impossible not to be struck with this difference in the views which these authors respectively take; viz. that M. Bayle regards the black matter met with in the lungs as a product of morbid action, and consequently as generated within the body, whilst Dr. Pearson considers it as independent of disease and as being introduced into the lungs from without along with the air in respiration. The question, therefore, naturally suggests itself, whether the black matter in the two classes of circumstances in which it was observed by these authors, is identical in its nature;—whether in

either of them it can be regarded as of the nature of melanosis, or how many different sources there may be of black discolouration of the lungs.

Since the publication of Dr. Pearson's paper, pathologists have very generally allowed that there does occur in the lungs a black discolouration depending upon a cause different from melanosis; but opinions have been considerably divided as to the cases in which the discolouration should be considered as of a melanotic nature, and those in which it should be attributed to a different cause.

M. Laennec, in his Work on Mediate Auscultation, published originally in 1819, treats of melanosis of the lung and black pulmonary matter, as distinct in their nature and effects. His account of black pulmonary matter, as distinguished from melanosis, corresponds very much with that of Dr. Pearson, to whom, however, he does not refer.

The black pulmonary matter, according to M. Laennec, exists so commonly in the lungs, even of the most healthy persons, that we can scarcely consider it as a morbid production. We find more or less of it in the lungs of almost every adult; and its quantity seems to increase in proportion with the age of the individual. In infancy, we generally perceive no trace of it; and the lungs at this age have as pure a rose colour as those of oxen and many other animals. He thinks it possible that the black matter may exist only in man and carnivorous animals, but professes himself not sufficiently versed in comparative anatomy to advance any thing with cer-

tainty on this point. With respect to its origin, M. Laennec professes to have often thought that this black matter might arise, in part at least, from the smoke of lamps and other combustible bodies which are used to afford heat and light, for from the examination of the bodies of several old persons, whose lungs contained little of the black matter, and whose bronchial glands were only slightly tinged with it, he had been led to suspect that it is generally in villagers, who are seldom in the habit of sitting up late at night, or consequently of employing artificial lights, that this kind of matter is found to be wanting. He admits, however, that the black matter is sometimes found in very small quantity in persons not accustomed to late hours.

When the black matter exists only in small quantity, M. Laennec remarks that it imparts to the lungs merely a slight greyish tinge. Towards the surface of the lungs it is disseminated in small black points, which, being more numerous and more thickly set along the intersections of the pulmonary lobules, form there striæ, small spots, or dotted lines. If these points be closer set, either at the surface or within the substance of the lungs, they form spots more or less numerous and extended; sometimes they are sufficient to give a black colour to large portions of the lung, but without altering the pliancy or the permeability of its tissue.

M. Laennec farther remarks, that it is principally in the bronchial glands that this black pulmonary matter is found in considerable quantity. In adult,

and particularly in old persons, these glands are frequently as black as ink; but in other subjects they are only partially stained with this colour, which appears as if irregularly applied with a brush. We can scarcely regard, he conceives, so common an appearance as morbid, the more so that it is met with in a multitude of subjects in whom there occurred during life neither cough, dyspnœa, nor any other symptom which could indicate it. This colour of the bronchial glands seems merely to produce the grey colour of the bronchial mucus which many individuals, otherwise healthy, spit up, and those small black points that sometimes present themselves in this transparent mucus.

M. Laennec had observed that the development of tubercles in the lungs, and especially the cicatrisation of tubercular cavities, frequently gives rise to an increased secretion of the black pulmonary matter. Sometimes the quantity of this is so great that, joined to the state of condensation which the texture of the lung undergoes, from the development of tubercles, of cartilaginous cicatrices, and of the cretaceous deposit that accompanies them, the part of the lung so affected becomes impermeable to the air, and at the same time there results a flaccidity of its tissue accompanied with a hardness equally well marked. This, however, seems rather to be owing to accidental cartilaginous and osseous productions than to the black matter itself.

Such is the general description given by M. Laennec of the black pulmonary matter. In regard to

the occurrence of true melanosis in the lungs, M. Laennec expresses his belief, that it is very rarely met with in these organs, and that M. Bayle had in some instances confounded black pulmonary matter with melanosis. He acknowledges that these two substances resemble one another very much in their external characters, and doubts whether the most practised eye could distinguish between a portion of melanotic structure from the liver or any other organ, and a bronchial gland entirely black, such as is often met with when the lungs themselves are very healthy; but he mentions the following characters as those by which one might be led to suspect some difference between the two substances. 1st. Softened portions of melanosis, and even the matter which exudes on pressing a portion that is still firm, stain the skin black, but this colour is very easily removed by washing; whilst the matter expressed from black bronchial glands takes such a hold of the skin, that, if we allow it to dry before attempting to remove it, it remains attached to this texture for several days. 2nd. In respect of chemical composition, he alleges that there are very essential differences. The bronchial glands contain, according to Fourcroy, a large quantity of carbon and hydrogen, but these principles are not met with in portions of melanotic substance which is almost entirely composed of albumen, and its colouring matter is of a peculiar nature. 3d. Melanosis produces all the local injurious effects of other forms of cancer, and is frequently found combined with one or with several other species of morbid

productions in compound cancerous tumours. M. Laennec adds, that when melanosis occurs in masses of some size, or is infiltrated into the pulmonary texture in such quantity as to give to it a deep black colour, and a consistency equal to that of liver, it may easily be recognised; but when it exists in the form of incipient infiltration, and is in too small quantity to harden in any sensible degree the texture of the lungs, it is difficult to distinguish it from black pulmonary matter.

In addition to these characters, in respect of which M. Laennec formally contrasts black pulmonary matter and melanosis, there are other, as he conceives, distinguishing circumstances to, which he adverts in the course of his description. Thus, 1st, according to his observation, the black pulmonary matter does not alter the pliancy or permeability of the pulmonary tissue, while the infiltration produced by the matter of melanosis has this effect. 2nd. In cases of the deposition of black pulmonary matter, the mucous secretion from the bronchia is of a greyish tinge, or intermixed with small black points. When melanotic matter is developed in the lungs, even in a great degree, it does not give rise to black expectoration, except perhaps at the moment when the melanotic matter, after having been softened, is discharged into the bronchia. At the same time, M. Laennec admits, that in extreme cases of combination of tubercular, cartilaginous, and cretaceous induration of the lung accompanied with black deposition, it is difficult to ascertain whether the colour and density

of the part affected depend on infiltration of the black pulmonary matter, or of the proper matter of melanosis. But in the majority of cases, he alleges, we can easily make the distinction, and the rules which he lays down as to be observed in drawing this distinction, are the following. 1st. We must not admit the existence of melanosis in the pulmonary tissue unless we find masses of it, of some size, and already softened; or at least so situated, and of such a shape as that it shall be quite impossible to confound them with the bronchial glands. 2nd. We must not admit the black matter with which the pulmonary texture is infiltrated to be of the nature of melanosis, unless it be to such an extent as to give it a density and hardness equal to that of liver; but if the lung be flabby, and its hardness owing to osseous and cartilaginous depositions, we must regard the black colour as produced simply by black pulmonary matter.

To illustrate his views as to the distinction between true melanosis occurring in the lungs and black pulmonary matter, M. Laennec has subjoined two cases; one of general melanosis in which the lungs participated in the disease; the other of imperfect cicatrices in the lungs, mixed with cartilaginous and cretaceous productions, with an accumulation of black pulmonary matter. In the first of these cases, which occurred in a woman 59 years of age, a cook by occupation, M. Laennec remarks, that no doubt can exist as to the nature of the black tumours observed in the lungs. The coexistence of similar tumours in different parts of the body, and the absence of the black

colour in the bronchial glands themselves, remove all doubt upon this subject. But in the second case, on the contrary, which occurred in a man of 60, whose occupation is not mentioned, several circumstances combine to render it difficult to determine whether the black colour of the indurated portion of lung depended on the accumulation of black pulmonary matter, or on the infiltration of the matter of melanosis. M. Laennec expresses his belief, however, that cases seldom occur in which there is so much room for doubt; and he regards it as not the less certain that, though difficult to distinguish from the black matter of the lungs in some particular cases, melanosis is a production entirely different from that matter.

In expressing his belief, that M. Bayle in establishing melanotic phthisis as a particular species, had not sufficiently distinguished between melanosis of the lung and black pulmonary matter, M. Laennec remarks, that in place of the progressive emaciation and hectic fever, which are the most constant symptom of tubercles developed in the lungs, melanotic affections have for their principal effects, the tendency to cachexia and anasarca, and most frequently occasion death before having produced a very marked degree of emaciation. The persons whom he had seen die in consequence of the development of melanosis in any organ, and those, too, in whom this matter occupied a large portion of the lungs, had no continued and well marked fever. The two observations of simple melanosis of the lungs contained in

the work of Bayle, furnish a similar result. If this character be constant, as he was disposed to believe, it might enable us to distinguish, during life, between consumption produced by melanosis of the lungs, and tubercular phthisis, which, as is well known, is constantly accompanied, during almost its whole duration, by a hectic fever, pretty generally characterised by two exacerbations, one occurring about mid-day and the other during the night. The most constant local effects of melanosis developed in the lungs, are, adds M. Laennec, a dyspnœa proportional to the extent of the affection, and a cough, frequently dry, but sometimes accompanied with a pituitous affection, very generally mixed with some purulent sputa.

But whilst M. Laennec regarded the black pulmonary matter and melanosis as two different productions, capable, though with difficulty, of being distinguished from one another, M. Andral [19] took a different view, maintaining that, in all instances, the black matter is the same, and that the diversities in other respects depend on the presence or absence of other forms of disease. This author remarks, that the black induration of the lung has been regarded as the result of the infiltration of its tissue by a matter of new production, by melanosis, this matter being supposed to be united or combined, particle to particle, with the texture of the organ in which it is developed. He acknowledges that, in a certain number of cases, the colouring matter which constitutes melanosis, may be deposited in each of the meshes or areolæ of the parenchymatous structure, and as-

sume a solid consistence, giving to the parenchyma an appearance of induration, just as it may form a solid deposit in a circumscribed spot, and constitute there a melanotic mass or concretion. But he thinks it can easily be shewn, that in most cases in which an organ is at the same time indurated and coloured black, the induration is independent of the black colour, and is the simple result of chronic inflammation. This he considers to be particularly the case in the black induration of the lung, or what has been called melanotic phthisis; inasmuch as the same induration of the pulmonary parenchyma is met with of all possible colours, red, light grey, dark grey, and slate-coloured. In some cases, he remarks, we may trace, on the same lung, the insensible transition from the grey tint to the deepest slate colour, the lung being in all parts equally indurated. The symptoms assigned by Bayle to this species of phthisis are besides, M. Andral alleges, absolutely the same as those which belong to every induration of the pulmonary texture.

Whilst M. Andral, accordingly, regards the melanotic phthisis of Bayle, or the black induration of the lung, as a form of chronic pneumonia with the addition of a colouring matter, he thinks we may conceive cases in which the black pulmonary matter may be formed without the texture in which it originates having been previously indurated, though the occurrence of black unindurated lung could not be admitted by those authors who regarded the induration as owing to the presence of melanosis. Instead,

therefore, of regarding, with M. Laennec, melanosis of the lung and black pulmonary matter as two distinct forms of production, M. Andral conceives the only difference to be, that in the one case, the discolouration coexists with an induration resulting from chronic inflammation, whilst in the other case it exists without induration.

The black induration of the lung, M. Andral states, has been observed at all ages of life: he has seen it occupying the whole upper lobe of the left lung in a girl nine years of age, and has frequently found it in persons under thirty. At the same time he admits that it is in old people that chronic pneumonia is most frequently accompanied with black discolouration, as if the disposition to the formation of tubercles, so decided in youth, were replaced, at a later period, by the disposition to the secretion of black matter. He further points out, as a remarkable circumstance, that when the black matter is very abundant, and the lung at the same time contains tubercles, there seems in some instances to be a tendency in these to heal, or at least their development appears arrested; as seems to be indicated by their cretaceous appearance, and their tendency to be changed into stony concretions.

M. Andral thinks that this black discolouration may result either from a simple modification which the blood undergoes in consequence of its remaining long stationary in the textures; or perhaps from the secretion of a particular colouring matter which is produced in different textures, under the influence of an

inflammatory process, as it is formed naturally in the choroid coat. He makes no allusion to the supposition of its ever being of extraneous origin *.

In 1826, my late lamented friend, Dr. F. W. Becker, published, at Berlin, an inaugural dissertation "de Glandulis Thoracis Lymphaticis," &c., in which he strenuously opposed the notion, entertained by Laennec, of the black matters found in the expectoration, or in the substance of the lungs or bronchial glands, being of extraneous origin. Professing to adopt the views which had been taken by Heusinger, in a work published a few years before, and entitled "Researches on the Accidental Production of Pigment and Carbon in the Human Body, considered particularly in relation to melanosis, the predominance of the venous system, yellow fever, and the atra-

* In the addition of M. Laennec's Work on Auscultation, lately published under M. Andral's superintendence, he has in a note referred to the "observations recently made in England, which do not allow us to doubt that, in a certain number of cases, the black colour of the lung is owing to the habitual and continued inspiration of an air loaded with particles detached from bodies also of a black colour, as for example with charcoal." After adducing some of the cases of this kind which have been published, M. Andral adds: "These facts had already attracted my attention, when M. Behier, élêve interne at the Hôpital de la Charité, presented to me a drawing which he had made of a lung wholly coloured black, like those of which the English authors speak, and found also in a person who habitually respired an air loaded with the dust of charcoal." This case, along with a plate representing the "black, and as it were, carbonized lung," M. Andral has inserted at the end of the third volume.

bilious diseases of the ancients," Dr. Becker endeavoured to connect the appearances above referred to with a deficiency in that decarbonization of the blood which it seems a main purpose of the function of respiration to effect. "It is well ascertained," says he, "that pulmonary respiration carries off carbon from the body; but it is still doubtful in what way the carbon comes into contact with the air; whether the oxygen of the atmosphere acts on the blood through cells, or reaches the carbon in any other way. The change that occurs can only be explained by supposing a double action,—the one, that of the blood expelling and secreting its carbon; the other, that of the oxygen of the atmosphere carrying this carbon off when it has been secreted, whether we suppose the carbon to present itself in a solid or in a gaseous form. Now it may easily happen that this double process shall go on unequally; that the blood may secrete a larger quantity of carbon in the lungs than the oxygen can receive and convert into carbonic acid. In this case, the excess of carbon is thrown down, or precipitated, as chemists say, in the form of the black matter of which we are speaking. Whence it must necessarily happen, that in those parts of the lungs which are every where pervious to the oxygen of the atmosphere, it will be secreted (thrown down) sparingly; but in those where the access of the oxygen is impeded, in greater abundance. This also appears from the circumstance that in old people the black matter is seen principally in large spots on the surface—that is to say, where the

air could not reach it, but rarely in the parenchyma itself. But the same production of carbonaceous matter which occurs in the parenchyma of the lungs, (or its common cellular texture,) takes place also on the surface of the mucous membrane of the bronchia, and this is the cause of the black discolouration of the sputa."

If we suppose the origin of the black matter in the lungs to be such as has been now described, it remains to be inquired, whence that found in the bronchial glands arises. Dr. Becker suggested two ways in which this might be accounted for; 1st, as some have supposed, it may be transmitted from the lungs by the lymphatic vessels; or, 2d, it may be produced in the glands themselves by a similar process as in the lungs. The first supposition appeared to him unsatisfactory, for he thought it improbable that such a matter, more or less solid, should be taken up by the lymphatic vessels, and conveyed uniformly to the same glands, and, as it appears, no farther, whilst this matter has never been seen in the vessels themselves, and he had himself in vain looked for it.

As to the possibility of the black matter originating in the bronchial glands themselves, Dr. B. gave the following explanation:—"I have assumed above, an inherent power in the blood, by which carbon is excreted in the lungs; which power, though originally prevailing in the lungs, manifests itself also in the neighbouring parts; and among these there are none which seem more suitable for a secretion of

this kind than the bronchial glands, inasmuch as they receive a larger quantity of blood, and retain it longer in their vascular apparatus, than all other textures." Whilst he admitted that the bronchial glands, properly so called, and the pulmonary glands, are most frequently and plentifully filled with black matter, Dr. Becker stated that he had seen this repeatedly also in the œsophageal glands, which do not receive any lymphatic vessels from the lungs by which the black matter could have been conveyed to them.

Lastly, as he conceived melanosis to result from a morbid exercise of that same power by which carbon is excreted from the blood, he could not concur with Laennec in the distinctions which he had established between black pulmonary matter and melanosis.

It is impossible to overlook the coincidence in the sentiments expressed by Dr. Becker respecting the source of black pulmonary matters, and those which we have quoted from Dr. Bree relative to the occurrence of black matter in the sputa.

" The efforts which M. Laennec makes," says M. Meriedec Laennec, in a note to a posthumous edition of his work, " to establish a difference between melanosis and black pulmonary matter, have not prevented this distinction from being generally rejected. Most anatomists of the present day are disposed to consider melanosis not as an accidental production in the sense attached to that expression by Laennec: it is to be considered only as a sort of impregnation of a normal or accidental texture, healthy or diseased, by a particular colouring matter. There is not conse-

quently, and cannot be any difference between black pulmonary matter and melanosis, properly so called; if it be not that in the former case the colouring matter is deposited in a healthy tissue, whilst in the second it impregnates a morbid or accidental tissue. In the softening of melanosis, therefore, we can recognize only the softening of textures with which the black colour is combined."

It seems singular that in these recent discussions as to the identity or non-identity of black pulmonary matter and melanosis, so little reference should have been made to chemistry as calculated to throw some light upon the question. Dr. Pearson had pointed out some important differences between black pulmonary matter and the natural black animal pigments, viz., the pigmentum nigrum of the eye and the dye of the cuttle fish, particularly as regards the reagents capable of dissolving them, and the action of certain reagents upon their colour. If these characters are sufficient, as Dr. P. conceived, to establish a positive distinction between the two classes of substances, then it is obviously an essential preliminary to any judgment as to the identity of black pulmonary matter and melanosis, to determine whether there is an identity in their chemical relations, or whether melanosis corresponds in its chemical characters with the natural pigments above alluded to. Several analyses of the substance of melanosis have been published; but in most, if not all of these, with the exception of Dr. Henry's, the chemists seem to have contented themselves, in so far as the colouring prin-

ciple of black matter is concerned, with establishing an analogy between it and the colouring matter of the blood, without particularly adverting to those circumstances by which its correspondence with the natural pigments on the one hand, or with black pulmonary matter on the other, must be determined. I shall here insert the results obtained by Dr. Henry [22] from the examination of a portion of softened melanotic matter, after it had been kept some time in spirit, which seem to establish its resemblance to the natural black pigments rather than to the black pulmonary matter as tested by Dr. Pearson.

1st. By filtering through paper, much of the colouring matter remained on the paper, and the colour of what passed through was much less intense.

2d. Boiling does not destroy the colour; not even when a little caustic potass has been added.

3d. It is not changed by acids even when heated, except by nitric acid, which deprives it of its black colour and turns it yellow.

4th. A stream of chlorine passed through the liquid destroys the black colour, and throws down light fawn-coloured flocculi.

5th. A few grains of corrosive sublimate stirred up with the fluid, precipitates the whole of the colouring matter, and leaves the supernatant liquid quite clear.

6th and 7th. Nitrate of mercury and muriate of tin produce the same effect, but more slowly.

"From these experiments, it appears," concludes Dr. Henry, "that the black matter (of melanosis) is a

peculiar secretion, analogous in some properties, especially in the 5th, 6th, and 7th, to the colouring matter of the blood. It would be necessary, however, to repeat and extend the experiments on a larger quantity of the fluid, and in a more recent state, before any just conclusion can be deduced respecting its nature."

It is obvious that if Dr. Pearson be correct in his position, that black pulmonary matter differs in its chemical properties from any of the animal secretions with which he compared it; and if, on the other hand, melanosis corresponds with these animal secretions in its chemical qualities, as Dr. Henry's analysis would seem to shew, this proof of the distinct nature of black pulmonary matter and melanosis cannot be overturned by any arguments, however ingenious, that can be adduced in support of their identity.

The opinion of M. Laennec with regard to the distinct nature of melanosis as occurring in the lung, and black pulmonary matter, has been defended in this country by Mr. Fawdington[22]. "It is necessary," says that gentleman, "to distinguish the morbid appearances of melanosis from the natural black pulmonary matter, which is found more or less abundant in all adults, and which appears to increase with age, sometimes to such an amount as to render the lungs nearly black. In this case, the permeability of the pulmonary tissue; the uniform dissemination of the black matter; its chemical composition; the deep grey or blue-black tint, which a secretion of it exhibits, in contradistinction to the red-brown of mela-

nosis, and the exemption of other textures, are characters upon which we may probably found a correct discrimination. In melanosis, not only is the substance of the lung affected, and the black matter distributed *en masse*, or in an encysted state, but their coverings often participate, and shew the disease in a particular form." To illustrate the difference between these two conditions of lung, Mr. Fawdington gives two delineations, figs. 1 and 2, Plate VIII.

In attempting to form a judgment as to whether, in those cases in which the lungs are exclusively the seat of black infiltration, this be or be not of the same nature as the matter of melanosis, we are naturally led to inquire what physical appearances melanosis exhibits in the lungs, in cases in which it occurs at the same time in other organs of the body, and in which consequently the melanotic character of the pulmonary degeneration seems fully established. For the elucidation of this point I have brought together the descriptions of the appearances presented by the pulmonary organs in those cases of general melanosis that have been put upon record, as far as these have fallen under my notice.

1. In a case of this nature, which occurred under Dr. Home, in the Royal Infirmary of this city[20], there were clusters of tumours resembling purple grapes on the right lung; the lungs were extensively beset with these tumours; and several of an exceedingly small size were detected under the mucous membrane of the bronchia.

2. In another case of general melanosis which oc-

curred in the Royal Infirmary of Edinburgh, under Dr. Alison[21], it is mentioned that within the thorax, a number of small black tubercles were situated on the surface of the pleura costalis, and others of larger size were attached to the surface of the lungs; all of them appeared enveloped in a slender cyst; the substance of the lungs was dark, and some minute tubercles were imbedded in it.

3. In Mr. Fawdington's case of general melanosis[22], there were seen lying upon the lungs a great number of circular or oval flattened tubercles, included in a fine transparent cyst, and attached by a slender hair-like pedicle to the subjacent membrane. In some places these tubercles were congregated so as to resemble clusters of dried currants; and in others, in which the filamentous attachment was especially observable, the tumours were insulated. The corresponding portion of the pleura was likewise dotted interstitially, and was a little raised by the melanose bodies situated beneath it. The pulmonary substance was crepitous, and had undergone no other change than in being the seat of a lightly scattered deposition, which imparted to it a carbonaceous appearance; and here and there, though not in large quantity, the matter of melanosis was distributed in an encysted form.

4. In M. Laennec's case of melanosis developed in a great number of organs[23], the lungs, which were of a rosy colour, presented some small melanotic tumours, but towards their basis and around the bronchial glands, there were found a great number of

a much larger size; the glands themselves were not black.

5. In a case of universal melanosis described by Schilling[24], it is mentioned that a great number of black tumours, of the size of a pea, were seated on the surface of the pleura pulmonalis and of the pericardium; nor was the parenchyma of the lungs free from them, but they were few in number, in this situation, and the texture of the lungs around them was healthy. There were some pounds of blackish water in the cavity of the thorax.

6. In another case, in which melanosis was conjoined with fungus medullaris, Schilling[25] mentions that there was a little yellowish water in the cavity of the chest. The lungs nowhere adhered. On their surface, there was, everywhere, a number of eminences, distinguished from the parenchyma of the lungs by their blackish colour. When the substance of the lungs was accurately examined, it appeared to be wholly beset by morbid degenerations of two kinds; 1st, round bodies of the size of a pea or of a bean, of a bluish-black colour passing into brown, more obscure externally, more distinct towards the centre. These bodies were of the consistence of the kidney or liver, and were obviously surrounded by a cyst copiously provided with vessels, and easily separated from the substance of the lung. The tumours of the second kind were seated deeper in the pulmonary tissue, towards the ramifications of the bronchia, less numerous but of a larger size than those of the first kind, being about equal to a walnut or chestnut.

These tumours, also, could easily be separated from the healthy structure of the lungs, and when cut into, were found to consist of two substances, an inner, forming as it were the nucleus, mostly soft and of a yellow-grey colour; and an outer, of the consistence of the kidneys, reddish and furnished with blood-vessels; but where the tumours adjoined the texture of the lungs, a stratum of black pigment was deposited, which, on separating the tumours from the pulmonary substance, adhered partly to the one and partly to the other. The tumours were most numerous in the inferior lobes of the lungs.

7. In a case described by M. Alibert[26], under the name of *cancer melané*, it is stated that the lungs, which in respect of colour shewed no mark of disease, contained, however, some small tubercles, enough to entitle us to say that they were affected with tubercular phthisis. But around the bronchial glands, in the substance of the mediastina, between the pleura and the internal surface of the ribs, black tumours were found in abundance.

8. In a case described by M. Lobstein[27], it is mentioned that the lung contained a number of small hard tubercles, of the size of a lentil, without the parenchyma of the viscus being thereby altered.

9. In M. Chomel's case of general melanosis[28], all that is stated respecting the chest is, that the lungs presented, towards their summit, some portions of melanosis.

10. M. Lobstein[29], in narrating the particulars of another case of general melanosis, mentions that a

very considerable melanotic tumour occupied the inferior lobe of the right lung. The matter which was contained in it was fluid, and as black as the ink of the sepia; it was infiltrated into the pulmonary parenchyma, which was altered and reduced into a filamentous texture. On minute examination, these filaments proved to be merely arteries and veins, washed with the melanotic fluid, and also containing it in their canals.

In none of the first eight of these cases does it appear that the lungs bore any resemblance to those described by Bayle as affected with melanotic phthisis. None of them can be regarded as cases of infiltrated melanosis. In all, the black matter formed tubercles and small tumours, which, in most of the cases at least, are described as having been encysted. In the ninth case, the state of the lungs is described too vaguely to enable us to form a judgment on this point. The tenth and last is the only one of these cases which seems to afford an example of melanotic infiltration.

I shall here introduce a few cases that have been communicated to me, illustrating the occurrence of black expectoration, or of black deposition in the lungs, in individuals whose occupations did not appear to render them peculiarly liable to an accumulation of carbonaceous matter in the respiratory organs; and in whom, at the same time, there existed no traces of a melanotic diathesis. For the first of these, I am indebted to Dr. W. A. F. Browne, now of Montrose. "I find," says Dr. B., "that the only notes I possess

of the case of black expectoration, are as follows. 1832–3, I attended Mrs. C., Carrubbers Close, during the winter months. She complained of dyspnœa, and increased action of the heart. The former symptom, which had existed for some years, was invariably aggravated during the winter months and during the night. Regularly about four in the morning, she is obliged to rise and open the door of her room, which is subterranean. After any sudden exertion, fatigue, going up stairs or up the close, mental emotion, &c., the difficulty of breathing is increased, pain is felt in the epigastrium, and the palpitation is excessive. Morning headache; tongue loaded; bowels costive; countenance pale and dirty; sound on percussion dull over the whole of the left lung; the sonorous râle perceptible over the whole of the same side; action of the heart distinctly heard over the whole chest; she was leeched; a blister applied to the epigastrium, &c. From these measures relief was derived. After taking a mixture, she began to expectorate, which she had not hitherto done, and requested me to examine the clotted blood which, she affirmed, formed part of her sputa. This matter was suspended in the mucus, in the form of distinct masses; it was quite black; appeared to be enclosed within a capsule; and was dry and gritty. She said that she had observed it for some time. Imagining that it must be some soot or similar substance accidentally introduced, I requested her to spit into a tumbler containing water, and to keep all that she expectorated. Next morning, the quan-

tity of mucus was very great, and the black matter proportionally so. It presented the same characters. Many of the nuclei were as large as beans, and though not, as I imagined, surrounded by a capsule, the mucus in contact with them was dense and more inspissated than elsewhere. They varied in size from beans to pin-heads, and resembled in every respect, powdered charcoal. Mr. Kemp, Teacher of Chemistry, declared that the physical qualities of the substance indicated charcoal, but was prevented by accidental circumstances from analysing it. The patient is a native of Orkney, in coming from which, many years ago, she caught cold, and was afterwards subject to colds and rheumatism. She never was in a coal-pit nor lived in the neighbourhood of one; never was a charcoal-burner nor where it was made; in fact, was never exposed to any cause by means of which this black matter could be introduced from without. The dark coloured expectoration continued for about a month; it then became colourless, and afterwards ceased altogether. The woman is still alive, and although subject, during winter, to a return of dyspnœa, she is comparatively well, and has never since noticed any traces of the clotted blood."

A second case in which a considerable quantity of black matter was contained in the expectoration of an individual not habitually respiring an atmosphere loaded with particles of carbonaceous matter, forms part of a communication with which I have been obligingly favoured by Dr. Moir, of Musselburgh.

"The other case was in a gentleman, and of course where there was no exposure to the inhalation of either noxious particles or vapours, unless it might be of carbonic acid, as he was the proprietor of an extensive brewery, and in the daily habit of inspecting the tun-rooms, the large vats in which overflow with that deleterious gas. He was, moreover, of a delicate habit, and had been, for years, more or less subject to an affection resembling chronic pleuritis. The fatal attack made its approaches in hoarseness of voice, ending in aphonia, and in a feeling of constriction about the top of the larynx. These symptoms gradually yielded to topical bloodletting and the application of sinapisms; but in the course of a few weeks, were succeeded by the expectoration of a muco-purulent matter, which seemed to come from the trachea, and was brought up with little difficulty. When a severe fit of coughing came on, the discharge from the lungs was very different, there being little or no pus, but flakes of melanoid substance which stained the handkerchief, after a temporary decomposition, as if they had been composed of a mixture of mucilage and charcoal or soot. This species of expectoration continued till death, which took place under circumstances of extreme attenuation, the power of swallowing having been for several weeks almost lost, or the act accomplished with a convulsive effort, which appeared to result from the pressure of the substance swallowed upon some ulcerated surface about the top of the bronchiæ. I had no opportunity of *post mortem* examination."

The two next cases which I have to mention illustrate the deposition of black matter also in the lungs of persons not peculiarly exposed to the inhalation of carbonaceous vapours. In one of these the expectoration for some time previous to death gave indication of the condition of the lungs. In the other case, it does not appear that the sputa had exhibited any peculiarity of appearance.

Dr. Moir has favoured me with an account of the case of "a man, a little above fifty years of age, who had been for a considerable part of his life employed as a coachman; he had latterly got into rather intemperate habits, and for some time before his death was a day labourer; his first occupation in that way being in a quarry, and his last in breaking stones for the highway.

"His first symptoms nearly resembled those of asthma, and were very gradual in their progress; and it was not until œdema of the feet and hands, and other symptoms of general debility had presented themselves, that the occasional expectoration of a black sputum arrested my attention. Death was preceded by eight or ten days of extreme dyspnœa, and general livid appearance of the skin, caused by congestion in the capillaries.

"On dissection, I found the right lobe of the lungs comparatively sound, there being almost no traces of tubercular disease; but instead, I here and there came in my sections on little cysts, containing some an inky, and others a tarry fluid, in different degrees of inspissation, and which stained the fingers, as if

with soot or charcoal. It was in the left lung, however, that the greatest morbid change had taken place. At the lower portion of the lobe, it felt quite indurated to the touch; and, in external appearance, the whole mass looked as if it had been long soaked in ink. On being cut into, the induration was found to proceed from a species of hepatization, through which numerous cysts, as in the opposite side, were interspersed; and in the upper portion of the lung, where the induration had made less progress, these cysts were still larger and more numerous, and here and there the scalpel came in contact with concretions about the size of a pea, composed principally of a black carbonaceous matter. The lung on the left side partially adhered to the pleura at its upper and back portion. In both cavities there was a considerable deposition of transparent and nearly colourless serum."

The next case fell under the observation of Dr. Paul Veitch, to whom I am indebted for the following particulars:—

"I first visited Mrs. W. in the month of January 1836, and found her labouring under all the usual symptoms of chronic bronchitis, great emaciation, profuse night-sweats, quick, rapid pulse, about 130 in the minute, and very copious frothy expectoration, streaked with pus. She said she had the first attack of this ailment about seven years previously, and had attacks every winter till two or three years ago, when the cough and expectoration became constant. Loud sonorous râles were audible

over the whole chest. Under the usual remedies and sending her to the country, she became considerably better, and continued so till January 1837, when she had an attack of the epidemic influenza, by which she was much reduced, and she gradually sank till the 4th of April, when she died.

"*Dissection.*—On opening the thorax, the lungs were found adhering to the walls of the chest in every point, by old and very strong bands of false membranes. The right lung appeared of the usual size, but the left was collapsed, the bands being about an inch and a half in length. Both lungs were in the state of spurious melanosis, being darker and denser as we approached the superior lobes, but they were melanotic throughout*. The bronchial tubes were dilated, the mucous membrane thickened, and pus could be very copiously squeezed out from them. The left ventricle of the heart was a little thinner than usual, the free margin of the mitral valve removed by erosion, the orifices being contracted and open; the aortic orifice contracted. This woman's husband was a plasterer: she never lived in the neighbourhood of a coal-pit or iron work, and was in general in excellent health till she was attacked with the illness above alluded to, about eight years before her death."

I now proceed to lay before the Society some communications which we have received from gentlemen of great sagacity and of much experience in the dis-

* See preparation in the Museum of the Royal College of Surgeons of Edinburgh.

eases of the workmen employed in coal-mines, who have never observed, in that class of persons, appearances such as were described in my former communication. This may, no doubt, without disparagement to their accuracy of observation, be, in part at least, attributed to the circumstance of their attention not having been directed to the subject; but the experience of those who have paid much attention to it seems sufficiently to prove that, in the different mines which have fallen under their observation, there has been great diversity in the liability of the workmen to the black affection of the lungs.

To a communication addressed at an early period of this inquiry to Mr. John Wilson, of the house of Messrs. Wilson and Sons, who, in the various operations connected with the working of coal, limestone, ironstone and aluminous schistus, and the manufacture of alum at and near Hurlet, in the vicinity of Paisley, employ nearly 400 men *, my father received the following reply:

"West Hurlet,
19 April, 1833.

"I have given a copy of your queries to a medical friend of great experience, and I have conversed with him and with other intelligent persons in Glasgow and the surrounding country, and the results of my inquiries are that consumptions of the kind you describe do not exist among miners in this part of Scotland. My own experience, for above fifty years,

* New Statistical Account of Scotland, No. XIV. p. 158, 9.

entitles me to say that no diseases of this nature have been noticed among the miners here. They use considerable quantities of gunpowder in all their operations of blasting coal, limestone, and aluminous schistus, and no bad effects have been felt. Probably the disease you describe is local, or peculiar to some of the miners in the counties of Edinburgh and Fife."

In a communication from Dr. Macgowan, of Alloa, of date 28th of January 1834, that intelligent gentleman says,—" As far as I have been able to learn, no such disease as that which you describe, viz. a species of pulmonary consumption characterised by black mucous expectoration, ever appeared at the Alloa colliery, where there is a population of at least one thousand, and my late uncle, (Dr. Haig,) knew the work for nearly half a century. It is also, perhaps, remarkable that I have never seen a case of phthisis pulmonalis at the colliery during a period of six or seven years that I have been going about it. The workmen are entirely engaged in coal-mining. The bearer of this letter, Mr. Craich, is the resident manager at the works, and can of course inform you as to the nature of the atmosphere the men are exposed to in their operations."

Mr. Craich mentioned to me, in conversation, that during a long course of years that he has been attached to that colliery, he has not known more than two colliers who died of consumption, in fact, fewer proportionally than of their relations who

are employed above ground; whilst in other collieries in Fife, it is consistent with his knowledge that the miners die at an early period of life, and chiefly, as he believes, from consumption, but he cannot say whether attended with black spit or not.

In a letter to Dr. Simson, dated 6th September, 1834, Mr. Girdwood says,—"I attended the colliery at Kinnaird upwards of eight years, during which period about 150 people, young and old, were employed under ground, and not a single case of consumption occurred. Since 1826, Mr. Consbrough has attended the same colliery, and he informs me that no cases of consumption have taken place under his observation. At present only about 100 people are employed. About a hundred weight of gunpowder is weekly expended in this work. It is employed as well by the colliers as by those who are employed in making the roads. In the colliery of Carron Hall, between 200 and 300 are constantly employed, and gunpowder used in the same manner. Mr. Mitchell has attended it for fifteen years, and reports no case of consumption to have occurred during that period in any person employed under ground. Mr. Graham attends the Duke of Hamilton's colliery, where between 400 and 500 are employed. He concurs with Mr. Mitchell and Mr. Consbrough in stating that there is no case of phthisis in progress in a collier at present. Must it not, therefore, be rare amongst these people? I may observe that the colliers employed in the Kinnaird and Carron Hall works are

all descended from colliers from time immemorial. There is scarcely an instance of their intermarrying with other people, at least it is but rare."

There can be few authorities on a subject of this kind entitled to more consideration than the writer of the following letter, Dr. Headlam, of Newcastle, whether we consider the extent of opportunities of observation, or the capacity of profiting by them.

"March 22d, 1834.

"In answer to your queries relative to a peculiar form of consumption attended with 'black spit,' said to be prevalent among coal-miners, I have to say that I am not aware of the existence of such a disease in this neighbourhood. I have had during my professional career a very extensive experience in the chronic complaints of pitmen, and I am of opinion that this class of workmen are less subject than others to phthisis pulmonalis, which perhaps may partly depend upon their mode of life, their diet, and the temperature in which they live. Pitmen begin to labour early in life, marry soon, and pass much of their time, about eight hours in the day or night, under ground in a temperate or rather heated atmosphere. Their cottages, to which they return when their work is done, are generally warm and comfortable, and their diet is of the best kind with abundance of animal food and finest wheaten bread, unless their work is restricted by the state of the coal-trade. They are rather a small sized race, and are generally shortlived. They are frequently affected with dys-

pepsia and dyspnœa, which seem in many instances to be produced by the impurity of the air in the mines in which they work. The oppression of their chest and the prostration of their strength, which they feel in certain situations, are quickly relieved by removal to a better ventilated part of the mine.

"I have enquired of many medical practitioners who have had great experience in this neighbourhood, and I do not find that tubercular consumption with black spit has been noticed by them.

"I have in particular submitted your queries to Mr. James Nelson, of Chester, a very intelligent surgeon, who has had the most extensive practice among coal-miners in this district. He says that he knows no particular form of consumption to which colliers are subject, although they may suffer from dust inhaled into the lungs, like quarry men or razor grinders. In this way some have been affected with irritation upon the Schneiderian membrane, who are relieved for a time by removal to another pit where the ventilation is more perfect. This is not observed to be the case in one class of workmen more than in another, nor to be peculiar to the blasters. The complaint in the lungs of pitmen is of an asthmatic character, it occurs chiefly in the middle of life, and has not been observed to be attended with black discolouration of the sputa."

Dr. J. Stewart Thorburn, of Liverpool, in a letter dated 8th January, 1834, informed my father that he had learned from a most intelligent coal proprietor $2\frac{1}{2}$ miles N. from Liverpool, that "in more than

twenty years' experience, he had neither heard of nor seen at any time, such a disease among his workmen as that described to him. He never knew of any chest affection proving fatal to them, with a single exception, that of a delicate girl in her teens, who died of pulmonary consumption of the ordinary characters. So far as his recollection goes, he never heard any workmen speak of a disease so very peculiar as that mentioned to him, as occurring in any coal-mine. According to his experience, coal-miners are very rarely affected with pulmonary disease. Coals of different kinds are obtained from his works, and one of these requires the use of gunpowder in blasting."

My intelligent young friend, Dr. Thomas Stratton, having gone in the course of last autumn to reside at North Shields, I requested of him to endeavour to ascertain whether the black pulmonary affection is known in the collieries of that district. In a letter with which he has favoured me, (dated 30th September, 1837,) he informs me that having made diligent inquiry on this subjeet during the previous month, the following are the results which he has obtained.

"In certain five collieries, employing in all 600 individuals, I could hear nothing of black expectoration. The miners themselves are sufficient authorities regarding their sputa, and the occurrence of black sputa was denied. The surgeons to several of the pits informed me that they had not seen any black expectoration, nor had any cases of black lung come under their observation.

"In two other collieries, employing 230 workpeople,

I could hear nothing of black expectoration from the miners, but the surgeon to these collieries informed me that he had observed it. He could not, however, furnish me with any farther particulars. He had not met with a case of black lung. I have enquired among workmen in iron foundries, &c., but have not discovered that they ever have black expectoration. I have also spoken to several of the medical men here, most likely to meet with such cases, and none of them have seen the black disease; one has observed black expectoration." Dr. Stratton then proceeds to inform me of the particulars of the examination of the body of a patient in the Tynemouth poorhouse, at which he had that day been present.

"*History of the patient.* G. H., a coal-miner, aged 70, worked in a coal-mine for 50 years; for the last four years has been an inmate of a poorhouse; he always enjoyed excellent health, and for thirty years was not ill for a single day. For some time before his death, he was under medical treatment, his symptoms being slightly pectoral, chiefly hepatic; he had ascites also and anasarca of the legs. His pectoral symptoms were those of chronic bronchitis; he did not expectorate much, and his sputa was never black.

"*Post mortem examination.* Both lungs presented a perfectly black appearance externally, and when cut into. A portion rubbed on the hand, left a black stain which was washed off with some difficulty, and a piece put into water, gave it the colour of china ink. Throughout both lungs were felt and

seen hard masses of black matter from the size of an almond downwards. These masses were more numerous in the middle lobe of the right lung and the middle part of the left lung, than in the upper and lower portions of either lung, and they were more abundant in the middle of the left, than in the corresponding part of the right lung. In the left lung were several chalky bodies encased in black matter. There was no black matter in the bronchial glands. There were extensive and firm adhesions of the left pleura. The heart natural. The liver and spleen were half their natural size. There was considerable ascites, the kidneys and intestines healthy."

Some ingenious remarks which Dr. S. has subjoined to his statement of this case, will find a place elsewhere. I hope the narration of it will induce practitioners in those coal districts in which black lung has not yet been observed, to keep a watchful eye on its occurrence.

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ACCOUNT

OF

A CASE

OF

ENORMOUS VENTRAL ANEURISM;

WITH THE

POST MORTEM APPEARANCES.

By Sir DAVID J. H. DICKSON, M.D.,
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READ APRIL 24TH, 1838.

Mr. Thomas Keane, æt. 36, late acting gunner of the Wasp, in the West Indies, was sent to the hospital at Jamaica, said to be affected with paraplegia, on the 22d September; discharged invalided on the 16th December, 1836, and received into this hospital on the 20th March, 1837. On admission, he complained, chiefly, of pain and uneasy feelings in the sacral region and loins, attended with weakness, partial loss of power, and numbness in the lower extremities, and imperfect command of the sphincter muscles; but his general health was not materially impaired. There was also a deep-seated and ill-de-

fined hardness, or swelling, in the left side of the abdomen, which was at first referred to an affection of the spleen, but which, on further examination, was discovered to be a large diffused pulsating tumour, either in contact with the abdominal aorta, or more probably arising from an aneurism of that great trunk itself or the common iliac artery: and thus the deep-seated pains, and numbness in the sacral region and thighs, at first simulating rheumatism, and afterwards lumbar abscess, as well as the occasional alternations of loose and torpid bowels, eneuresis, &c., were accounted for, by the compression of the vessels and nerves, and especially of the hypogastric plexus. It is singular that, though the patient frequently complained of sickness and anorexy, and had occasional vomiting, yet nausea was not a very prominent or distressing symptom in this case; and notwithstanding the tumour continued to enlarge and diffuse itself, and its aneurismal character became more and more evident, his general health, though subject to occasional relapses, appeared to improve, and on the 6th of September he was quite as well as usual. On the afternoon of that day, although he was enjoined quietude, he imprudently went over, between three and four o'clock, to visit a brother officer on the opposite or surgical side of the hospital. Soon after ascending the stairs, he was seized with excruciating pain in the right iliac region, followed by excessive faintness, and a death-like paleness of the countenance, indicating the rupture of the aneurism, and, after suffering much pain, he expired

at 6 P. M. It is needless to say anything of the treatment in such a case; nor shall I dwell longer upon the symptoms, which were satisfactorily accounted for on dissection, and for the details of which I am indebted to the very minute and careful investigation of Mr. Weale, my first assistant.

Sectio cadaveris, seventeen hours after death. Upon opening the cavity of the abdomen, a small quantity of bloody serum escaped. The posterior reflection of the peritoneum, on the right side, presented an ecchymosed appearance, from subjacent semicoagulated blood, which, effused in vast quantity, had raised the membrane from its attachments behind, and separated the laminæ of its different processes from each other. The blood was discovered to have escaped by an ulcerated opening of the size of a shilling, in the side of an immense tumour near to the right kidney, which it had displaced forward and laterally; and which, on further examination, proved to be an enormous aneurism of the descending aorta. The aneurismal dilatation, upon further investigation, was found to commence from the posterior part of the artery, two inches above the cœliac axis, by a kind of neck, which extended to two inches and a half above its division into the iliac trunks; where, suddenly bulging out, it expanded over the whole of the abdomen. The tumour was so immense indeed, that with the exception of the cæcal region, from which it diverged to the left, it might be said to occupy the epigastric, both hypochondriac, the umbilical, and left iliac regions, and the pelvis. But to describe it more

minutely, the aneurism, accommodating itself to the concavity of the diaphragm, to which, as well as to the posterior inferior surface of the liver, it intimately adhered, lay behind the hepatic vessels and ducts, the pancreas, duodenum, &c. It was attached to the false ribs and spine, and descending between the latter and the vena cava and aorta, it continued downwards behind the ureters and iliac vessels, but separated from them by the iliac fascia, which, greatly condensed, formed one of its anterior coverings, and beneath which it insinuated itself. The tumour thence protruded in a conical form under Poupart's ligament, and appeared like an aneurism of the left iliac artery. This vessel lay in front and the ureter crossed it obliquely, while the psoas lay internally. The iliac muscles and crural nerve externally, and the great sciatic nerve were closely attached to its posterior inferior part. When this immense aneurism was laid open, it was found to be nearly filled with coagulated blood, of the consistence of wet clay, and some concentric layers of nearly colourless fibrine adhered, though not vascularly, to its walls. The lining of the sac, on the tumour being emptied, appeared of a vivid red colour, mottled with osseous scales, deposited in the fibrous tunic, which, in a great measure, prevented its collapse. A careful examination was then made of the coats of the aneurism: the external covered it completely, except where it adhered to the spine, where the tunics had entirely disappeared, and the last dorsal and first lumbar vertebræ were also partially absorbed. The

middle coat was continued over the sac, or so gradually lost in the other coverings, which in some places were increased in thickness to nearly two inches, that its termination could not be detected. The internal tunic was continued for some way into the sac, where it became broken down, and undistinguishable from the adjoining clots. The abundant deposition of ossified matter in the middle coat prevented the collapse of the artery, from the pressure before and behind; and, by maintaining its cylindrical form, preserved a channel for the blood. Two small appendages, resembling knuckles, of intestine, were observed on the iliac portion of the great tumour, and containing blood of the same appearance; but they were distinct from it, being closed by the adhesion of their necks; and their walls were thin and of a purple grape colour. The abdominal and thoracic viscera, generally, were normal, with the exception of some pleural adhesions; and the body was muscular and not much emaciated. So intimate was the attachment of the tumour to the spine, that the lumbar and three dorsal vertebræ were removed with it.

ON THE

PROPORTIONS

OF

ANIMAL AND EARTHY MATTER

IN THE DIFFERENT

BONES OF THE HUMAN BODY.

BY G. O. REES, M.D. F.G.S.

COMMUNICATED BY THE PRESIDENT.

READ MAY 8TH, 1838.

My principal object in prosecuting the following researches was to discover the cause of the great discordance in the results of chemists who have occupied themselves in determining the proportions of the earthy and animal matter contained in human bone. I was inclined to believe that a chemical difference might exist in the bone according to its situation or use in the organismus, and that the discrepancy of result might be caused by different bones having been used for examination. The experiments of Thilenius* rendered this explanation very probable; that

* Vide Lehrbuch der medizinischen chemie, von Carl Frommhertz, (erste lieferung.)

chemist heated the bones he examined till all the carbonic acid was driven off, and then weighed his results from four different bones for comparison; he thus observed a considerable difference, which might however have been owing to a greater loss of carbonic acid* by one bone than another, as well as a greater loss of animal matter. His experiments cannot therefore be looked upon as conclusive, for it has not yet been shown that all bones contain the same relative proportion of phosphate and carbonate of lime, which is necessary to render his experiments available even in a comparative point of view. They can never be positively correct since lime *as carbonate* must be looked upon as a constituent of the earthy part of human bones, and as such contributes to those peculiarities which result from the greater or less proportion of earthy constituents present. The only observations I have been able to find (besides those of Thilenius) concerning the relative proportions of animal and earthy matter in human bones from different parts of the skeleton, are those of Dr. John Davy, who showed that the bones of the head in the adult contained more earthy matter than those of the trunk. I have little doubt, from my own observations, that the differences in the results of chemists may be assigned to three different causes, viz.—

1st. The employment of different bones for analysis; nearly every bone having a proportion of earthy and animal matter peculiar to itself.

2nd. The bones used for examination being dif-

* From the carbonate of lime.

ferently prepared, and containing more or less of fat, which will be estimated in the analysis as animal matter of bone, whereas it is merely an infiltration into its structure.

3d. The loss of different quantities of carbonic acid during decarbonization, owing to its conversion into carbonic oxide gas, which escapes at a low heat from carbonate of lime when carbonaceous matter is present. A portion of carbonic acid must almost necessarily be lost by bone-ash during incineration.

The experiments which I here bring forward were made on bones from the same adult individual; they were similarly prepared in every respect, perfectly dry, and quite free from fat, periosteum, and cartilage. After the decarbonization of each specimen, I took the precaution of supplying the loss of carbonic acid which it had experienced, by moistening the result with a solution of sesqui-carbonate of ammonia, and then carefully applying heat to low redness*. The results of analysis were as follows:—

		Earthy matter.	Animal matter.
†	Femur	62·49	37·51
	Tibia	60·01	39·99
	Fibula	60·02	39·98
	Humerus	63·02	36·98
	Ulna	60·50	39·50
	Radius	60·51	39·49

* Berzelius has proved that the carbonate of lime in bones contains lime united to carbonic acid in the same proportion as in common chalk; the method of proceeding above mentioned necessarily yields such a compound.

† Solid parts of the shafts were used for experiment.

	Earthy matter.	Animal matter.
Temporal bone *	63·50	36·50
Vertebra †	57·42	42·58
Rib ‡	57·49	42·51
Clavicle	57·52	42·48
Ilium §	58·79	41·21
Scapula ‖	54·51	45·49
Sternum	56·00	44·00
Metatarsal bone of great toe	56·53	43·47

The foregoing analyses lead us to the following conclusions :—

1st. The long bones of the extremities contain more earthy matter than those of the trunk.

2nd. The bones of the upper extremity contain somewhat more earthy matter than the corresponding bones of the lower extremity; thus the humerus more than the femur, and the radius and ulna more than the tibia and fibula: this difference is, however, small, being about one half per cent.

3d. The humerus contains more earthy matter than the radius and ulna; and the femur more than the tibia and fibula.

4th. The tibia and fibula contain, as nearly as possible, the same proportions of animal and earthy matter, and the radius and ulna may also be considered alike in constitution.

5th. The vertebra, rib, and clavicle are nearly iden-

* Hard squamous portion.
† Arch of dorsal.
‡ Solid external crust.
§ Near the crest.
‖ Coracoid process.

tical as regards the proportion of earthy matter; the ilium containing somewhat more of earths, the scapula and sternum somewhat less; the sternum containing more earthy matter than the scapula.

6th. The bones of the head contain considerably more earthy matter than the bones of the trunk, as observed by Dr. J. Davy; but the humerus and other long bones are very nearly as rich in earths.

7th. The metatarsal bones may probably be ranked with those of the trunk in proportional constitution.

The more cellular bones and the cancellated structure have been supposed by some to contain an increased proportion of animal matter. Being anxious to examine this point, I analysed the cancellated structure of the head of the femur, and that from the centre of the body of a rib, in order to compare them with the solid parts of the bones. My results were as follows:—

	Earthy matter.	Animal matter.
Cancellated structure from the head of the femur	60·81	39·19
Cancellated structure from the body of a rib	53·12	46·88
Solid structure of the same rib	57·77	42·23

From these experiments it appears that the cancellated structure (at least in the rib) really contains less earthy matter than the more solid parts of the bone; this difference, however, is not considerable*.

* Berzelius states that the cancellated structure is as rich in earthy matter as the solid part of bones.

Having shown that the adult bones differed in their proportional contents of animal and earthy matter, it became a subject of interest to determine whether the same law of relative proportion could be ascertained to exist in the fœtal skeleton. To investigate this, I procured several of the bones of a fœtus (full grown within a few days), and having had them similarly prepared *, I subjected them to analysis, and procured the following results, which (though necessarily derived from less than 100 grains) I shall give in 100 parts.

	Earthy matter.	Animal matter.
Femur	57·51	42·49
Tibia	56·52	43·48
Fibula	56·00	44·00
Humerus	58·08	41·92
Radius	56·50	43·50
Ulna	57·49	42·51
Clavicle	56·75	43·25
Ilium	58·50	41·50
Scapula	56·60	43·40
Rib	57·35	42·65
Parietal bone	55·90	44·10

On examining these results, it will be observed that several of the conclusions regarding proportional constitution hold good with the fœtal bones, which I have shown to pertain in regard to those of the adult. Thus—

* These bones were perfectly dry, deprived of their epiphyses and periosteum, and contained no fat.

The bones of the upper extremity contain somewhat more earthy matter than the corresponding bones of the lower extremity.

The humerus contains more earthy matter than the radius or ulna, and the femur more than the tibia or fibula.

The ilium contains somewhat more, and the scapula somewhat less earthy matter than the clavicle or rib.

The great difference observable in the proportional constitution of the adult and fœtal bones, consists in the fact, that the long bones and the bones of the head in the fœtus, do not contain the excess of earthy matter which we observe in those of the adult. Thus the humerus of the fœtus, which is the richest in earthy matter of the long bones, contains 58·08 per cent. of earths, while the ilium of the same subject is found to contain 58·5 per cent. of earthy matter. The parietal bone, which was examined as the type of the cranial bones, gave a proportion of earthy matter less than that of any bone that I have examined. The results of the analyses of the bones of the trunk in the fœtal skeleton show that they contain animal and earthy matter in the proportions of the adult; and, therefore, that the difference of compactness observed between them, must be the result of mechanical arrangement rather than a difference in the proportion of earthy and animal matter. There is little doubt that the general conclusion, that fœtal bones are deficient in earthy material, has been derived from comparative experiments made on the long bones of the

extremities, where such deficiency certainly exists. I subjoin for comparison the per centage of earthy matter contained in some of the bones of the fœtus and adult.

	Fœtus.		Adult.
Rib	57·35	per cent. of earths.	57·49 per cent.
Ilium.....	58·50	.....	...58·79
Scapula...	56·60	.....	54·51
Clavicle...	56·75	.....	57·52

From this comparison, it appears that the bones of the trunk in the fœtal skeleton are as rich in the proportion of earthy matter as those of the adult; at least the difference is too small to be material. The deficiency of earthy matter in the bones of the fœtal extremities is simply explicable on the fact that such an excess of earths as appears necessary to very great strength of bone is not needed at birth, and therefore only appears in after life.

The existence of a general law, regulating the proportion of earthy deposit in the different bones, (which is shown by the curious agreement of relative proportion observed between the fœtal and adult skeletons,) adds one more to the many proofs of the regularity and perfectness of design which Nature evinces in her operations.

59, Guilford Street, Russell Square,
April, 1838.

ON A SUCCESSFUL PLAN OF ARRESTING THE DESTRUCTION OF THE TRANSPARENT CORNEA FROM ACUTE PURULENT INFLAMMATION OF THE CONJUNCTIVA.

By FREDERICK TYRRELL,

SURGEON TO ST. THOMAS'S HOSPITAL, AND TO THE ROYAL LONDON OPHTHALMIC HOSPITAL.

READ MAY 22D, 1838.

THERE are few medical men who have not witnessed the destruction of the eye for visual purposes by acute purulent inflammation of the conjunctiva, and most are aware that such an effect results from injury to the transparent cornea.

Those who have devoted their attention more especially to the study of ophthalmic diseases, know how rapidly fatal the purulent disease often proves to the cornea, in spite of the most assiduous and

prompt adoption of the ordinary remedies, and that the energetic employment of the most active means often fails to arrest the fatal progress of the complaint. Having myself witnessed the repeated failure of depletion, by local and general blood-letting, by nauseating medicines, by purgatives, abstinence, &c.; of the influence of mercury, of the local application of powerful astringents and stimulants, and of all ordinary means; I was induced to study the disease most attentively, conceiving that a perfect knowledge of its progress, and of the mode in which the destruction of the cornea takes place, might afford some explanation of the failure of the various plans of treatment which I have mentioned, and which have been hitherto employed; nor was I deceived, for such investigation has afforded me most satisfactory evidence of the mode in which the cornea is destroyed in the most acute and severe cases, and it has, at the same time, enabled me to suggest and put into practice a remedy which has exceeded my most sanguine expectations in its beneficial results.

I have since had ample opportunity of testing the remedy: quite sufficient, I consider, to warrant my offering it to the profession, perhaps not as infallible, but certainly as one of extreme value in the treatment of this hitherto most destructive disease.

In order to make the subject plain to all my professional brethren, I shall first describe the mode of organization of the cornea; secondly, explain how it is so rapidly destroyed in acute purulent ophthalmia; thirdly, detail the mode of applying the remedy

which I have found so successful; and lastly, give some cases in illustration of its effects.

It is not my intention to enter into the history of the particular character and modifications of the purulent disease, but only so far to describe its symptoms or progress as may be necessary to render the plan of treatment which I have to propose clear and simple.

The situation, figure, and extent of the transparent cornea, are too well known to need description on the present occasion. The body consists of numerous thin laminæ, united together by a very delicate cellular tissue, which contains a perfectly colourless and limpid fluid. It is fixed at its circumference to the anterior edge of the sclerotic tunic, and the fibres of the latter are so intimately blended with the margins of the laminæ of the former, that the skill of the experienced anatomist fails to detect their precise mode of union. On the anterior or convex surface of the cornea is placed its conjunctival or mucous covering, continuous with that which invests the anterior portion of the sclerotic; but the mucous membrane is so firmly bound down immediately over the junction of the cornea and sclerotic, and its texture becomes so delicate where it covers the former, that it is very difficult to demonstrate it by the ordinary anatomical means. Its existence in connection with the cornea, and the continuity of the corneal portion with that of the sclerotic, become, however, most distinctly developed by morbid action, which also proves that the principal vascular supply of the cornea is obtained from the

vessels of its conjunctival tunic, for in all the diseases or injuries of the cornea, which cause distension of the vessels by red blood, so as to render them perfectly visible, the principal or largest vessels are invariably perceived ramifying in the conjunctival membrane, and from these large vessels more minute and extremely delicate ramifications can be frequently traced into the substance of the cornea itself; this is obvious in coroneitis or inflammation of the substance of the cornea, and again in the chronic diseases of this structure, such as result from continued strumous conjunctivitis, or from the irritation of the granular eyelid, also, in the healing of ulcers of the cornea. In pure inflammation of the cornea, I have frequently seen the vessels of the conjunctiva passing from over the sclerotic to the surface of the cornea, and then ramifying most minutely in the substance of the latter, and at the same time, I could scarcely discover a vessel filled with red blood in the sclerotic tunic itself, even when the vessels of the cornea have been extensively injected with red blood. I have been thus satisfied that the vascular organization of the cornea is principally derived from the conjunctival, and little, if at all, from the sclerotic vessels.

The posterior or concave surface of the cornea is lined by a portion of serous membrane, which is common to the whole anterior chamber; this also becomes evident under morbid changes, though it can hardly be demonstrated satisfactorily in the human eye by the most skilful dissection;—the blood-vessels of this serous membrane are derived principally from

those of the iris, and after supplying the membrane, some very minute ramifications pass to the posterior or internal laminæ of the cornea; but these are few and insignificant to those which the cornea derives from its conjunctival layer. During the repair of ulcers, which have extended through the aqueous membrane into the posterior laminæ of the cornea, I have been able distinctly to trace the vessels of the aqueous membrane, and the delicate ramifications to the cornea.

Thus the principal corneal blood-vessels are derived from those of the conjunctiva, which covers it anteriorly, but it also receives a trifling supply on its inner surface from the vessels of the aqueous or serous membrane which lines it.

The nerves of the cornea are principally derived from the fifth cerebral, and I believe that their distribution follows very much the same course as the arteries. I adopt such opinions also from pathological observations, and from witnessing the effects of division of the fifth nerve, in the rabbit and dog, upon the cornea and conjunctiva. The source of the vascular supply is, however, at present, the most material point, and pathology gives us ample proof of its being such as I have described.

Acute purulent inflammation of the conjunctiva, whether of idiopathic or specific origin, presents similar characters, runs through the same stages, and leads to the same consequences, if unchecked. The morbid action commences in the palpebral conjunctiva, with itching, smarting, or burning sensa-

tions, a sense of grit and weight in the lids, and stiffness; a light yellow secretion at first is poured out in small quantity, which collects and coagulates on the cilia, and at the canthi; at this time, the membrane lining the palpebræ is found of a deep carmine colour, thickened, and its villi prominent, so that it presents an appearance somewhat resembling that of the mucous surface of a finely injected fœtal stomach; the cilia are loaded with coagulated secretion, and the surface of the globe suffused with lachrymal fluid and purulent secretion. This may be termed the first stage.

Next some severe and continued pain is experienced, the eye feels exceedingly full or distended, the sense of weight and stiffness of the palpebræ augments, the morbid secretion becomes very copious, and of a deeper colour; the ocular part of the conjunctiva at this period participates in the disease; it first assumes a pink colour, from the injection of its vessels minutely by red blood, (this is, however, limited to the sclerotic portion of the membrane,) next it becomes thickened and villous, and afterwards raised by deposition in the cellular tissue between it and the sclerotic, so that it is elevated around the margin of the cornea; and this elevated condition of the membrane is termed chemosis. At the time in which this conjunctival change takes place, on the surface of the globe, the palpebræ become tumid, red, and painful; and the tegumental surface tense and shining, as if affected by erysipelas.

The deposit in the cellular tissue beneath the sclerotic portion of the ocular conjunctiva, is of serum or fibrin, or of both; it usually commences at the inferior part, and gradually extends upwards. The chemosis, therefore, may be incomplete or complete, as surrounding the margin of the cornea partially or entirely; when it is complete, the cornea is in momentary danger by destruction of its vitality, which takes place in the following manner: the elevation of the sclerotic part of the ocular conjunctiva by subjacent deposit, renders it tense, and creates so much stress and tension on that part which is firmly bound down over the junction of the cornea and sclerotic, that the circulation through its vessels becomes impeded and ultimately arrested, so that the principal vascular supply of the cornea is cut off, and it dies or mortifies in part or in toto. The cornea first assumes a nebulous appearance, but its brilliancy remains; this, I believe, to result from the deficiency of the interlaminar fluid, in consequence of impeded circulation; it resembles closely the appearance which may be produced by pressing the cornea firmly with a narrow body, so as to press the lamina together, and exclude the interlaminar fluid. This nebulous state is usually general, and of short duration, and is succeeded by a dull and dense opacity of a part or of the whole of the cornea, which, at the same time, loses its brilliancy. There is not, at any time, evidence of any inflammatory action, either in the cornea or in its conjunctival covering,

and the destruction of these parts is usually too rapid to be the result of such morbid action in the textures themselves.

The cornea then mortifies from a strangulation of its blood-vessels, and this strangulation is produced by the chemosis or the elevation and tension of the conjunctiva, which covers the sclerotic. In proof of the rapidity with which the cornea is destroyed, I can state that I have ascertained it in one instance to be perfectly sound at eleven o'clock, and found its destruction complete at seven o'clock following; but I believe the mischief to be even more quickly accomplished in many cases.

Having ascertained thus much by careful observation, I could hardly fail to resort to such means as would immediately relieve the tension of the chemosed conjunctiva, or to try the effect of free division of it, having due regard to the course of its principal vessels, and I determined upon the following mode of doing it; to raise and secure the upper eyelid as far as possible, as in the operation for extraction, and then to make free incisions into the sclerotic portion of the ocular conjunctiva, and the subjacent loaded cellular membrane, without injury to any other textures of the globe. I considered it essential that the incisions should extend close to the margin of the cornea where the tension and pressure would be greatest, and that the direction of the wounds should correspond to the intervals between the insertions of the recti muscles, so that the principal vessels of the conjunctiva of the globe should not be injured.

My opinion of the probable efficacy of this proceeding was heightened by a knowledge of the excellent effect of a similar plan of treatment in cases which I consider to be somewhat analogous, viz., in cases of severe phlegmonous inflammation of cellular tissue in other parts of the body, having often witnessed the arrest of gangrene and mortification in such cases by making the incisions through the skin and loaded cellular membrane, which, no doubt, acts beneficially by relieving the tension of the former, and by partially unloading the latter, and thus removing a pressure which impedes or arrests the circulation.

I was aware that incision or excision of parts of the conjunctiva had been suggested and effected in the condition of chemosis, and that the result of such treatment had not been very satisfactory; this want of success, however, appeared to me as a consequence of the misapplication of the principle, and not from error in the principle itself; for the incisions in the membrane, or excisions of portions of it, had been generally made in a direction corresponding to that of the margin of the cornea, and frequently extended completely around it; thus the vessels passing to the corneal portion of the conjunctiva must have been in great part, if not entirely divided, and the supply of the corneal portion and of the cornea cut off or nearly so; the operation tended therefore rather to augment than diminish the mischief it was meant to arrest. This error arose from ignorance of, or inattention to the anatomy of the organization of the part.

My plan being decided upon I soon had opportunity of carrying it into effect.

A young man of robust make and of good constitutional power applied for advice at the London Ophthalmic Hospital, having acute purulent ophthalmia of specific origin (gonorrheal) in one eye. The palpebræ were excessively swollen, tense and shining, the morbid secretion thick, copious, and of a deep yellow colour mixed with green; the chemosis was complete, and the cornea generally hazy or nebulous; but its surface was brilliant except at one point, at its nasal side close to its margin, where mortification had begun. The disease had not existed twenty-four hours.

I immediately divided the chemosed conjunctiva freely from the margin of the cornea towards the orbit once or twice in each space between the attachments of the recti muscles, making in all six or seven incisions; they were effected by means of the knife used in the operation of extraction to divide the cornea; the point being inserted just over the junction of the cornea and sclerotic, and passed outwards, the back of the knife being kept close to the sclerotic, as its acute edge divided the affected membrane; each incision had a direction radiating from the centre of the cornea. The chemosis was firm and principally fibrinous. Directly after the operation hot water was applied to encourage the bleeding. Soon after, the patient was bled from the arm, to the extent of about fourteen ounces, sufficient to relieve the fulness and firmness of his pulse; he took fifteen grains of calomel

and colocynth, and was further directed to take calomel, gr. ij. opii, gr. ss. every six hours; to apply leeches freely to the palpebræ if pain recurred, and to bathe the eye frequently with a decoction of poppy, warm; his diet was to consist of gruel, tea, toast and water, or soda water.

On the next morning I found that the disease was checked, the largest portion of the cornea had recovered its transparency, but an oval spot equal to about one sixth of the whole was dead; the chemosis and tumefaction of the palpebræ were much reduced; the conjunctiva was but lightly coloured; the morbid secretion was thinner and less copious, and he was free from pain; his medicine had acted freely, and he had applied a dozen leeches to the eyelids on the preceding evening. A continuation of the plan was ordered.

In forty-eight hours after I had divided the chemosed membrane, the acute stage was annihilated, and he left off the calomel and opium; partook of a more generous diet, being allowed a moderate portion of animal food, and he began to use a solution of alum, (gr. ij. ad ℥j.) and a very weak preparation of the citron ointment at night (Ɔss. ad ℥ij.) to the affected eye; at this time the secretion had become thin and white, the swelling of the palpebræ and the chemosis were but trifling, and the mortified part of the cornea had begun to separate; the patient recovered rapidly under a gradual augmentation of these means, and escaped with a small, dense, opake cicatrix in the cornea, which did not interfere with vision.

The result of this case was extremely satisfactory

and gratifying to me, for I had not previously seen a single case in which the eye had been saved when the disease had made the same extent of progress.

I have since had numerous opportunities of testing the soundness and advantage of dividing the chemosis in a similar manner, and have found it successful beyond my expectations; indeed it effects more than I had contemplated, for it prevents the necessity of severe general depletion, which I have known patients to suffer from the effects of for weeks and months afterwards.

I shall select a few other cases in illustration, and then take the liberty of offering a few remarks on the subject.

Two young men, each about nineteen or twenty years of age, of good constitutional power, and robust make, applied at the Ophthalmic Hospital in the same week, being, however, strangers to each other. Each suffered from acute purulent ophthalmia, and the disease had reached the second stage, chemosis being complete, and the palpebræ swollen and florid. The cornea in one was slightly hazy, but in the other clear. The diseases were of gonorrheal origin, and had not existed more than forty-eight hours, and the affection was confined to one eye in each patient. There was no constitutional disturbance in either, and each had a good natural pulse.

The chemosed membrane was freely divided in each case, as I have described; and the bleeding resulting from the incisions was encouraged by the use of hot water for some time. Afterwards each patient

took an active dose of calomel and colocynth, and was directed to apply twelve or eighteen leeches to the palpebræ in the afternoon; to continue the use of fomentation, and to pursue the most simple plan of diet, and take only toast and water or gruel. Calomel, gr. ij. and opium gr. ss. were prescribed for both patients every six hours.

In three days, the disease in each was so far subdued, that the calomel and opium was left off, and a more generous diet, consisting of a small quantity of animal food daily, was allowed, and the local applications were made astringent and slightly stimulating, and under a gradual augmentation of these means the patients rapidly got well. The most unfavourable case, or that in which the cornea had a hazy appearance at first, recovered perfectly, and the cornea regained its usual transparency in a few days from the commencement of the treatment.

A young man, twenty-three years of age, of strumous habit, and enfeebled by want of proper nutriment, (he having been unable to procure employment,) was attacked with violent purulent inflammation in both eyes, in consequence of exposure outside a coach during a wet and cold night, as he was coming to London to seek for work. Two days after the commencement of the ocular disease, he was brought to the Ophthalmic Hospital; and at this period the palpebræ were very much swollen, red, and tense. There was a profuse purulent discharge, and when the globes were exposed, chemosis was discovered complete in each eye, and in the right eye

mortification of about one fourth of the cornea, with a general haziness of the remaining portion, but in the left eye the cornea was clear. He was pallid and his pulse feeble. I incised the chemosis in each eye freely, and prescribed a brisk purgative; small doses of calomel and opium night and morning; leeches to the palpebræ in the afternoon of the same day; frequent use of poppy fomentation, and a moderate diet, with broth or beef tea, milk, &c. Two days afterwards, the tumefaction of the palpebræ was so much reduced, that he could open the eyes so as to expose the cornea without aid. The secretion was white and thin; the conjunctivæ of a pale pink colour, and the chemosis had greatly subsided. The mortified part of the right cornea had begun to separate, whilst the remaining portion of this tunic, and the entire of the left, presented a clear and healthy character. His diet was improved, and some quinine was prescribed; at the same time the local applications were made astringent or stimulating, alum lotion and citron ointment being employed. The recovery was rapid, but an indelible white spot exists on the right cornea.

A married woman, about twenty-eight years of age, mother of three children, was sent to my house from the country, in the autumn of 1837, having suffered severely from acute purulent ophthalmia for five or six days. The palpebræ of both eyes were very much swollen, red, and tense. There was a copious thick purulent discharge. There was complete chemosis in each eye, and both corneæ were

hazy, and a dull opaque spot existed on each, but of greatest magnitude on the left eye. She had been actively treated by bleeding, generally and locally, by purgatives, abstinence, &c., and was pallid, with a feeble, quick, and easily compressible pulse. She suffered from continued pain and uneasiness, but not so severely as she had done a day or two previously. From the extent of local mischief, and the feeble condition of the patient, my prognosis could not be otherwise than very unfavourable; but I considered it to be my duty to make every exertion to preserve even part of one cornea. I therefore immediately, (in my own room,) incised the chemosis very freely, and applied hot water with a sponge for fifteen or twenty minutes, and then sent the patient off to the Ophthalmic Hospital in a coach, with written directions for her to have a good diet of animal food, and a moderate quantity of porter; two grains of sulphate of quinine, with a little acid and infusion of roses every six hours, and locally to use poppy fomentation and a simple ointment; to be blistered behind the ears, and to have leeches applied to the palpebræ in case of return of pain. She had been freely purged before I saw her, and the secretions were in good order when she came up to town, except, perhaps, that of the skin, which was somewhat inordinate; and this induced me to prescribe the mineral acid with the quinine, whilst the very low condition of power, and weak circulation, determined me at once to begin with tonic remedies generally. A very rapid change took place, for on the next day the palpebræ were

very much reduced in size and colour; the discharge was thinner, the chemosis greatly lessened, and a line of demarcation apparent around the mortified part of each cornea, whilst the parts retaining vitality had lost much of the haziness which had existed the day before. The alum was now added to the poppy decoction for a lotion, and the plan previously prescribed persevered in. In a few days the mortified parts of the cornea separated, nearly one half in the left eye, and about one third in the right, and the separation of each slough opened the anterior chamber, so that the aqueous fluid escaped, and the iris protruded in each eye, and plugged the opening through the cornea. The openings into the anterior chambers were not of serious magnitude, that in the right eye being about as large as a small pin's head, and that in the left rather larger than the rounded end of a probe; for the inner laminæ of the cornea, and the aqueous membrane, had not suffered to the same extent as the conjunctiva corneæ, and the superficial layers of the cornea itself; but in tracing from without to within, the extent of destruction gradually lessened, as is usually the case, except when the entire cornea mortifies.

As the sloughs separated from the corneæ, a more generous diet was given, and the strength of the local applications increased, citron ointment being used instead of the spermaceti; and when the separation was completed, a weak solution of nitrate of silver was applied to the surface of the eye daily, for a few days, till the healing action was fairly established in

the cornea. Belladonna was also applied to the eyebrows during the same period to restrict the protrusion of the irides. The patient gradually recovered, with opacities of each cornea, and disfigured and diminished pupils. The opacity of the left cornea occupied above two-thirds of the space of the texture, and completely covered a small pear-shaped pupil, which was drawn beneath the opaque part. The opacity of the right occupied about one half of the cornea; and the pupil, of a pear-shape, and diminished nearly one half, was in great measure covered by the opaque cornea.

She has returned home, and will come to town again in the spring of 1838. I expect much of the opacity existing when she left the Ophthalmic Hospital, will be removed by absorption, so as to afford her tolerable vision with the right eye; whilst I feel satisfied of being able to extend the small pupil of the left eye, so as to bring it beneath the remaining transparent portion of the cornea, which exists in the most favourable position, viz. downwards and outwards; but she can, even in her present state, guide herself about, and perform common domestic duties*.

The following case will be found highly interesting in several respects.

A medical gentleman, aged nearly forty years, contracted acute purulent ophthalmia in the left eye, in consequence of some matter spirting into it from an abscess of one of the lacunæ of the urethra, which

* June 8th, 1838. The operation contemplated above has been performed, and the patient now has good vision.

he punctured for a patient under his care. Ophthalmia did not appear for some days after, but then came on in a very acute form. He was treated most actively, by general and local blood-letting, blistering, purging, abstinence and mercurials; but in spite of all this, the cornea became hazy, and the disease commenced in the right eye. I was then requested to see him, and found him pallid and feeble; with a quick, small, compressible pulse; much feeling of debility, little or no appetite, the bowels acting freely, and his gums and tongue swollen and tender from the influence of mercury, of which the fœtor of breath and the discharge of saliva gave further evidence. The palpebræ were swollen, red, and shining, but most so in the left eye; the discharge of thick yellow matter was copious; complete chemosis existed in each eye, the cornea of the left was hazy at the outer part, and dull and opaque at the inner, almost to half its extent; the cornea of the right eye was perfect.

I first freely divided the chemosed membranes in each eye, and encouraged bleeding from the part by application of hot poppy decoction; and then prescribed nutritious diet, some quinine, with infusion of roses and acid, and an astringent gargle; and locally, the alum with poppy decoction and a simple ointment. This treatment succeeded in arresting the mischief. In less than forty-eight hours the acute local symptoms had subsided, the tumefaction of the palpebræ and conjunctivæ being much reduced; the discharge lessened and thinner; the left cornea exhibited a defined slough of mortified part, and the

right cornea remained clear and perfect. The recovery was very slow in consequence of the extreme debility induced by treatment previous to my seeing the patient. The slough separated from the left cornea, and caused a large opening into the anterior chamber, which became plugged by the iris at first, and I concluded the eye would be saved from further mischief; but from some slight blow, or sudden effort in sneezing, a further prolapse of iris occurred; the lens became displaced, and eventually escaped through the opening in the cornea, after which the opening gradually closed, and absence from business in the country for a few weeks restored the general health. This gentleman has now a perfect right eye, and in the left, the inner half of the cornea is opaque, but the pupil has been destroyed by the prolapse of the iris, which is united in the cicatrix of the cornea. Useful vision might be obtained by forming an artificial pupil.

A case of very severe gonorrheal ophthalmia has occurred in the person of a delicate and feeble scrofulous young man, aged 19, and been treated at the Ophthalmic Hospital during the last month. He applied about nineteen hours after the first appearance of disease in the eye, yet the palpebræ were excessively swollen and red, and the chemosis complete, but the cornea fortunately clear. I was obliged to use the speculum, to expose the globe, before I could effectually divide the chemosed part, and could then only make five incisions. Bleeding was encouraged by warm water, and he took a mild aperient; in the

afternoon a few leeches were applied to the eyelids, and the eye was frequently bathed with poppy decoction, containing a small portion of alum. I prescribed calomel gr. i., opii gr. ss. night and morning, and directed that he should have a moderate quantity of good nutritious food. The treatment has perfectly succeeded in saving the eye, but the patient still has some slight chronic affections remaining.

Several other cases have been submitted by me to this plan of operation, and with equal success, so much so, that in every instance in which the eye could be saved, it has been saved. In no one instance has the disease extended, or the mischief increased, after the adoption of this treatment. Some of my colleagues and pupils have tried this plan, and speak in the highest terms of its efficacy. It enables me to look with satisfaction and confidence to the treatment of a disease, which I could not view previously without distress and horror.

In conclusion, I beg to observe, that I do not claim the merit of being the first to propose division of the chemosed conjunctiva, as a means of relieving the cornea from risk under acute purulent inflammation, for, as I have observed, I was previously aware of such a plan having been proposed and effected, but I trust that I have given a satisfactory explanation of proper principles and effects of the operation, and shewn that it is adopted on a scientific basis, is safe and easy of performance, and more efficacious than any plan hitherto proposed. Besides, it possesses these advantages :—

It renders unnecessary active depletion, or the adoption of any severe general or local measures, likely to injure the general health, or to produce severe suffering.

It cannot increase the risk of the case.

It has been tried sufficiently to warrant my stating that it will rarely be found to fail, and I offer it with confidence to those, who, I feel satisfied, will give it a fair trial, and decide candidly and honestly on its merits.

EXPLANATION OF THE PLATES.

PLATE I.

REPRESENTS Mr. Beaumont's instrument, described page 29.

Fig. 1.—*a* The needle point and ligature.

b the broad blade.

c the spring in the back of the broad blade.

f a screw, which fastens the blade *a*, to the rest of the instrument. This blade is made moveable in order that it may be changed for a needle of different curvature.

Fig. 2.—The back of the broad blade.

d the hole at the extremity of the blade, through which the needle point and ligature are carried when the blades are closed.

e the spring which, when pushed forwards, catches the ligature in its point, and holds it at the extremity of the broad blade.

PLATE II.

Section of the tumour of the clavicle described in Mr. Travers's paper, page 135.

a sternal portion.

b articular surface next the scapula.

PLATE III.

1.—Portion of the left ventricle of the heart of a female, aged 32, who died of dropsy, from chronic inflammation of the lungs. About the centre of the interventricular septum, there is a deep, defined cavity, capable of holding a bean, which is divided into two unequal portions, and which is evidently an enlargement of one, or perhaps of two of the natural interspaces or depressions between the meshes of the fleshy columns. The specimen would appear to exemplify *one mode* in which a true aneurism of the heart may originate. See page 230.

Fig. 2.—A portion of the left ventricle, with numerous round, hollow, fibrinous coagula among the fleshy columns, and one large one at the apex, which has been laid open. The latter has, by pressure on the ventricular walls, led to their atrophy, fibro-cellular degeneration, and consequent dilatation. The preparation (No. 361. Pathological Series. Hunterian Museum) exemplifies *another mode* in which a true aneurism of the heart may originate. See Case 6, pages 213, and 230.

PLATE IV.

Portion of the left auricle and ventricle, exhibiting

a very considerable aneurismal dilatation of the right division of the mitral valve; which is pierced by three holes, and projects into the left auricle.

This plate is from a copy of a drawing in the possession of Sir Astley Cooper. The preparation is in the museum of St. Thomas's Hospital, No. 1444. See Case 9, page 251.

PLATE V.

Portion of the right auricle and ventricle of a heart, having a large perforation in the upper part of the interventricular septum. The tricuspid valve opposite to this opening is dilated into two large, and two minute aneurismal (varicose?) sacs. The largest of these which is seated directly opposite the opening in the septum, is a dilatation of the ventricular surface of the valve; whilst the next in size, with the two smaller ones which are concealed behind it, are dilatations of the auricular surface of the valve. A portion of the opening in the septum, shaded very dark, may be seen between the aneurismal sacs.

From a preparation in the Museum, Royal College of Surgeons, London; No. 128. Malformations. See Case 10, page 253.

PLATE VI.

Represents the lower jaw-bone of Maria Pitchford, the excision of which is described in Mr. Perry's paper, page 290. The preparation is in the museum of St. Bartholomew's Hospital.

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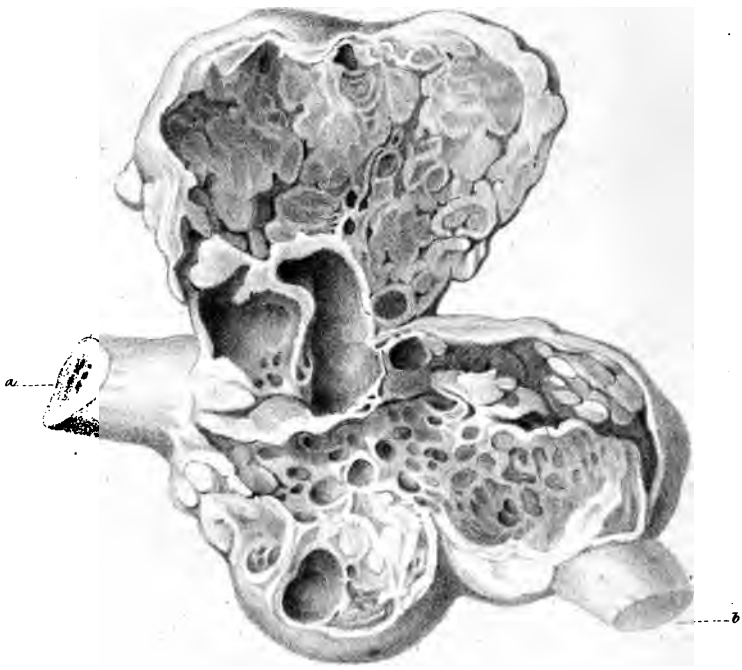

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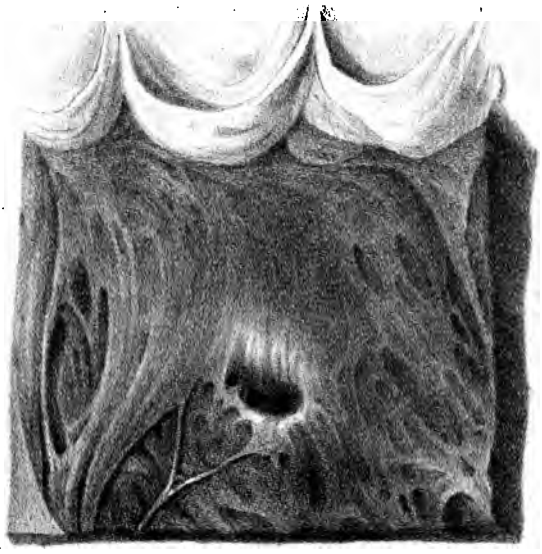

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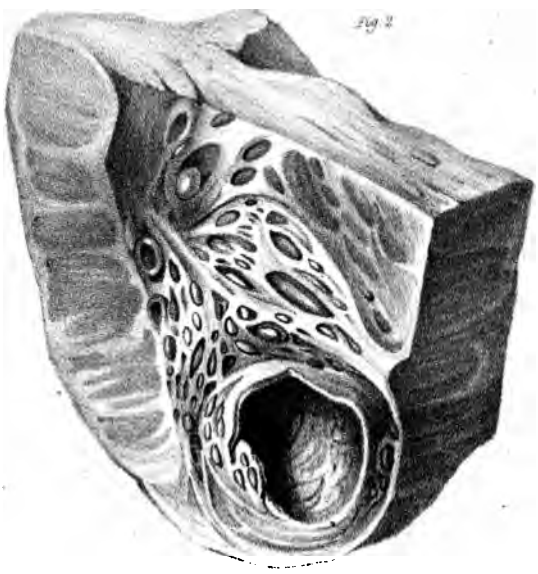

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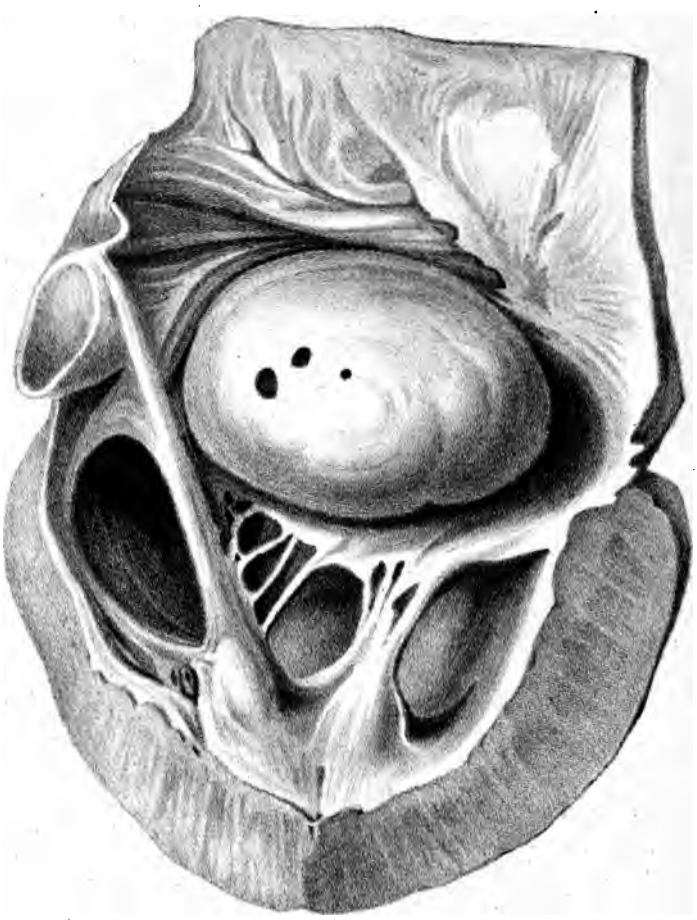

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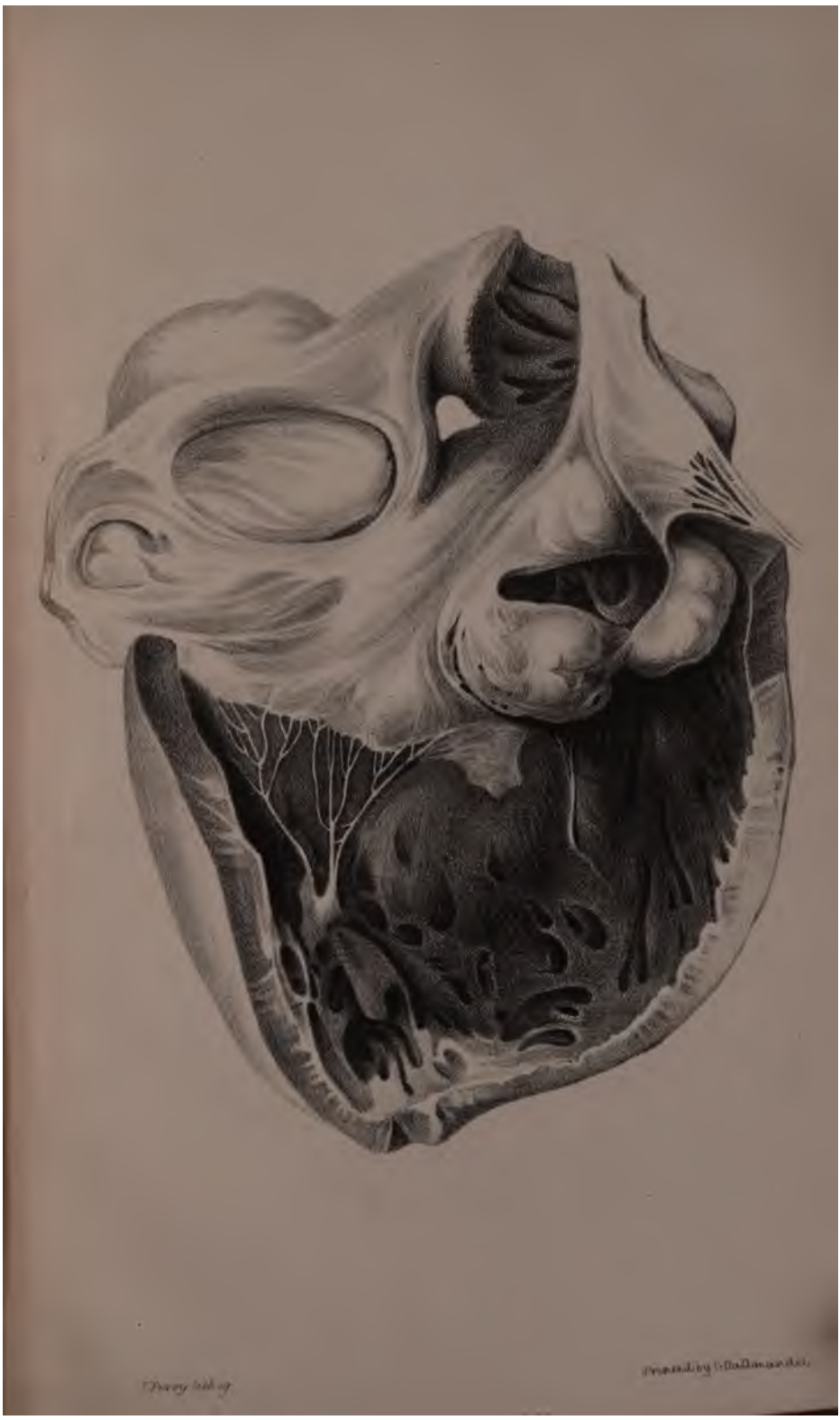

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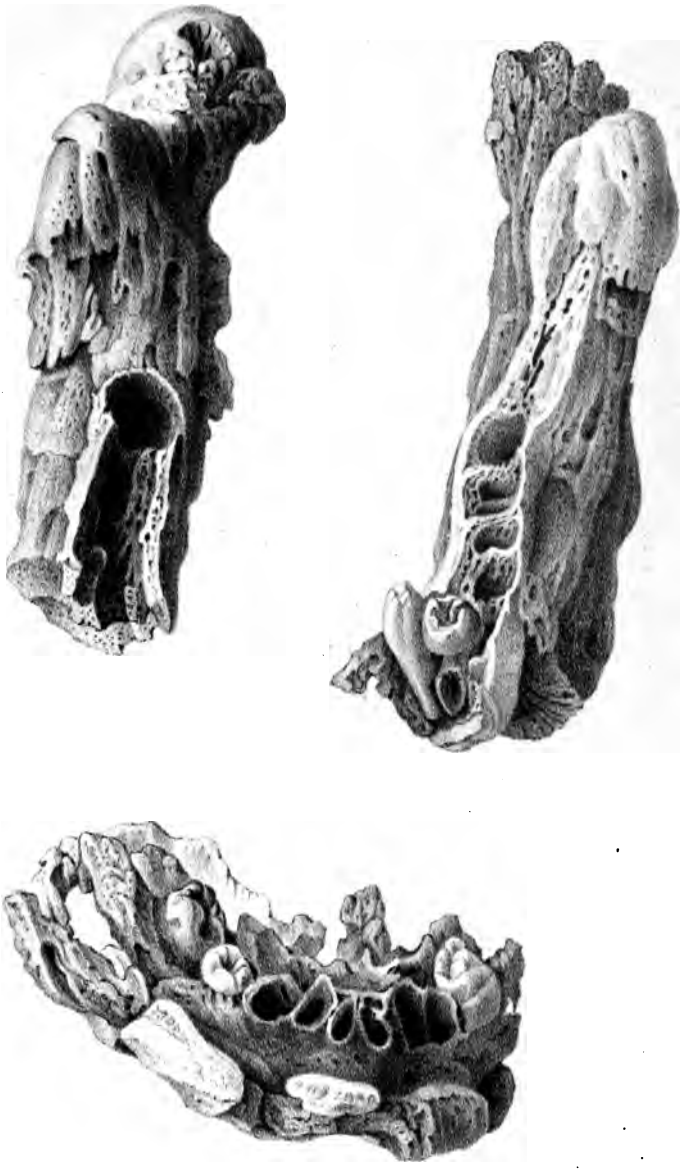

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